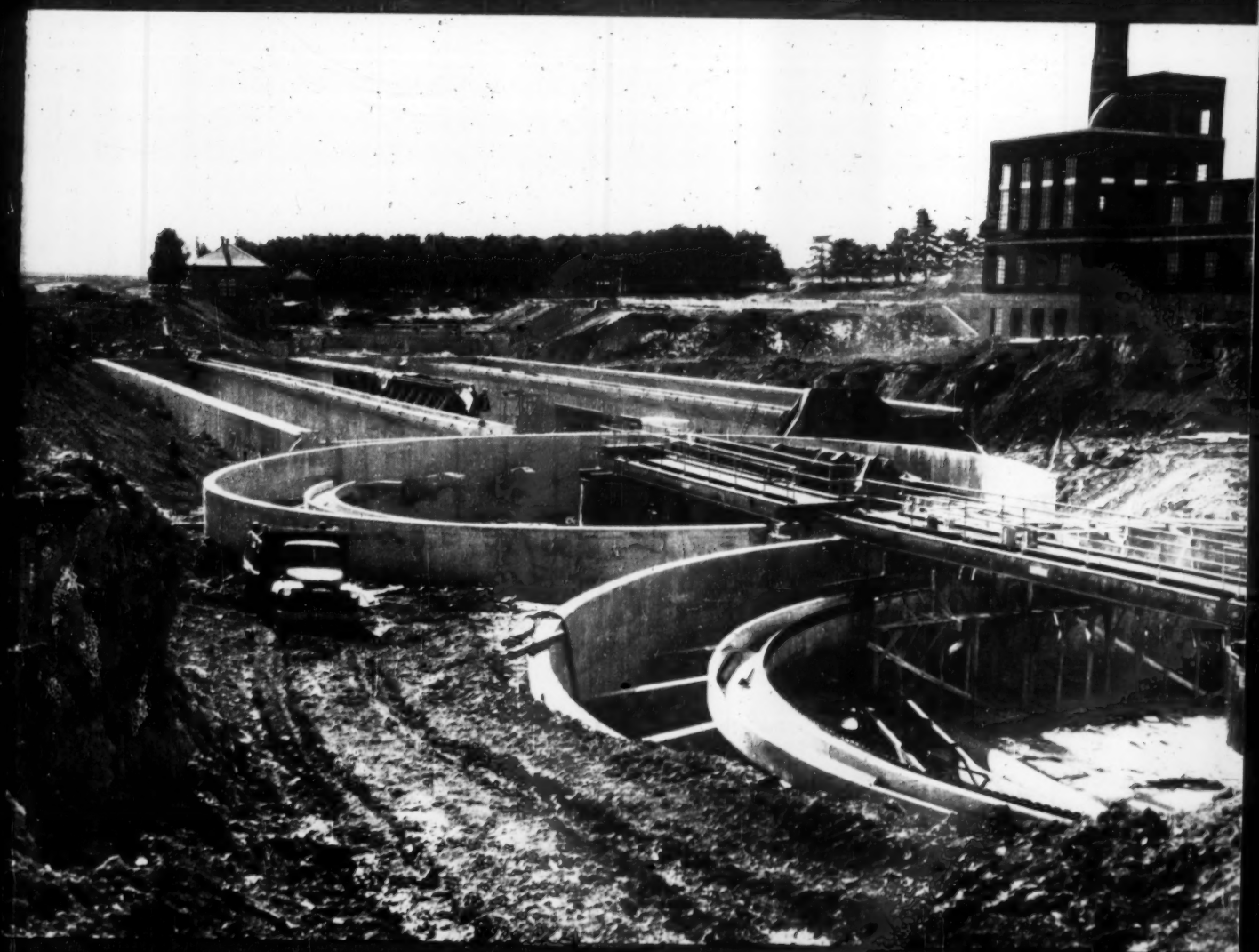
ENGINEERING NEWS-RECORD



E B POWER GS
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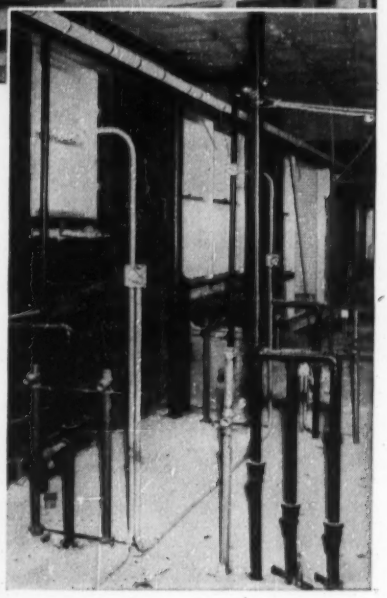
A McGRAW-HILL PUBLICATION

WROUGHT IRON PIPE keeps corrosive plumbing and heating services off the "sick list"



The comfort and health of patients and staff, and the economical use of maintenance-budget dollars were leading considerations in the planning of this $20,000,000 hospital. One evidence of this aim is the use of wrought iron pipe to safeguard heating and plumbing services from premature failure. More than 230 tons of wrought iron pipe was installed in soil, waste, vents, and leader lines, compressed air and vacuum lines 1¼ inches and larger, and return lines in trenches.

The hospital, located in East Harlem, was built under the jurisdiction of the New York City Department of Public Works.

Maintenance records provide plenty of examples of the consequences of using non-durable materials in these services—and the wisdom of using wrought iron pipe. In many reported cases, for example, wrought iron pipe has doubled, tripled, and even quadrupled the useful service life previously obtained from low-first-cost piping, and ended maintenance headaches that had been regarded as incurable.

The use of wrought iron pipe in heating and plumbing lines, and a roundup of many of the buildings where this material is serving, is discussed in our new bulletin, *Piping for Permanence*. Write for your copy.

A. M. Byers Company, Pittsburgh, Pa. Established 1864. Boston, New York, Philadelphia, Washington, Atlanta, Chicago, St. Louis, Houston, San Francisco. Export Department: New York, N. Y.

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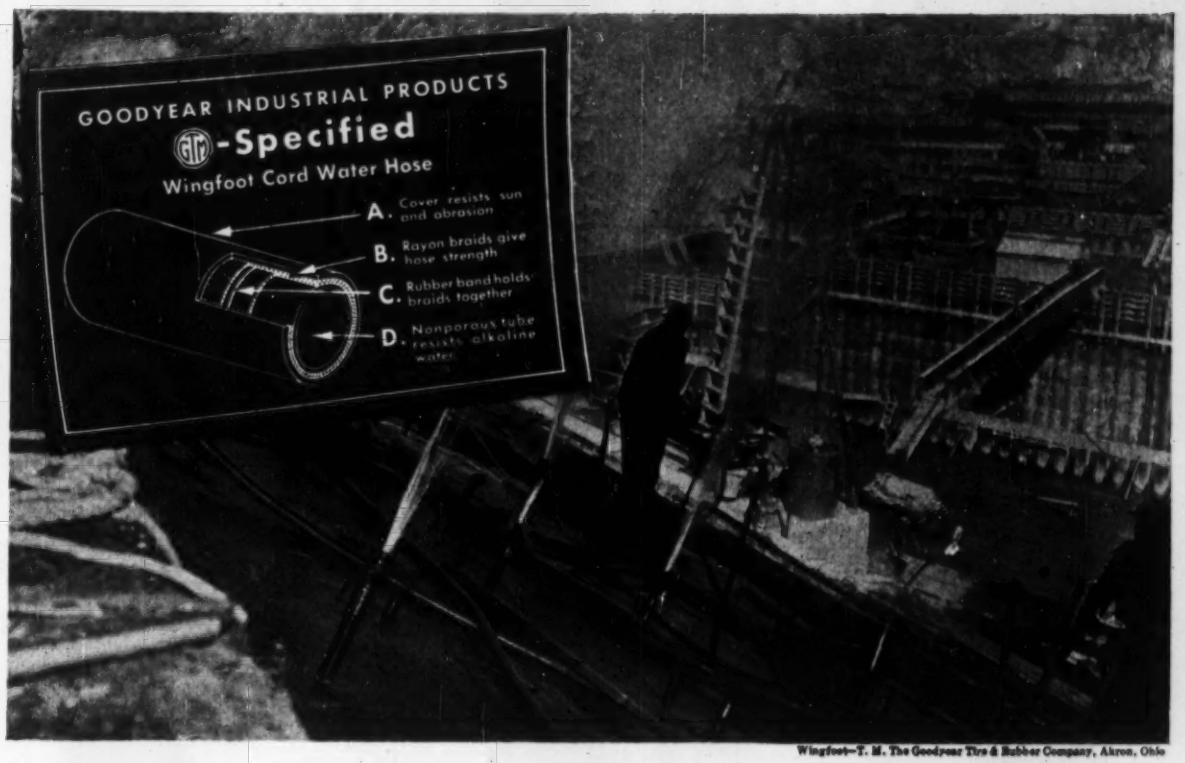
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G.T.M.-Specified
Wingfoot Cord Water Hose
A. Cover resists sun and abrasion
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Wingfoot—T. M. The Goodyear Tire & Rubber Company, Akron, Ohio

UNUSUAL USE *PROVES* UNUSUAL VALUE

OF WINGFOOT CORD WATER HOSE

WHEN a huge concrete dam cures, tremendous heat is generated. This must be dissipated quickly and evenly to prevent structural weaknesses. The heat removed from Montana's great Hungry Horse Dam, for instance, was equal to that liberated in burning about 5,500 tons of coal. It was accomplished by pumping millions of gallons of water through approximately 1,000 miles of 1-inch steel tubing imbedded in the concrete.

To serve as the connecting links between the lengths of tubing, a tough, flexible, lightweight hose was needed. Because of the large quantities needed, cost was a big factor. To fill this bill of requirements, the G.T.M.—Goodyear Technical Man—specified WINGFOOT CORD Water Hose. Several miles of this low-cost, durable hose were purchased.

And it did an excellent job. The construction crew liked its ease of handling. The contractor liked the way it withstood abuse and the wear of being dragged over the rough concrete. It was another case of the G.T.M. recommending the right hose for the job. Something he'll be glad to do for you, if you'll just contact your Goodyear Distributor or write:

Goodyear
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YOUR GOODYEAR DISTRIBUTOR *can quickly supply you with Hose, Flat Belts, V-Belts, Packing or Rolls. Look for him in the yellow pages of your Telephone Directory under "Rubber Products" or "Rubber Goods."*

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Robert F. Boger

Publisher

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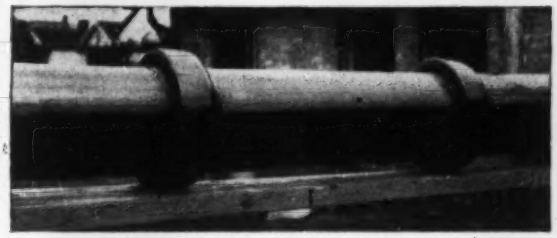
1. Amvit jointed pipe will withstand hydrostatic pressures far exceeding any required.

2. On this test pressure was held at 22 pounds, at least 10 pounds higher than average requirements.



3. Not a drop of water leaked from any joints at 22 pounds pressure.

4. Accelerated test simulated many years of service. Joints still perfect.

The First Mechanical Clay Pipe Joint

NEW AMVIT JOINTED CLAY PIPE IS ROOT PROOF AND INFILTRATION PROOF

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- **Easily opened for installation of new laterals**
- **Jointed pipe available 4", 6" and 8"**

THE Amvit Joint is made of a new acid-resistant plastic material with rubber characteristics molded dielectrically on the pipe. The joint is "built-in", shipped to you ready for installation.

This joint is a true mechanical joint based on the ball and socket principle. A ring is molded by a special process in both the bell and on spigot, the bell ring is concave, the spigot ring convex. Since the diameter of the spigot is somewhat larger than the bell opening, the joint is under constant compression of more than 30 psi when the rings are pushed together. Nothing can force into or out of the joint.

Yet, a section of pipe can be removed from the line to install new laterals without disturbing the entire line.

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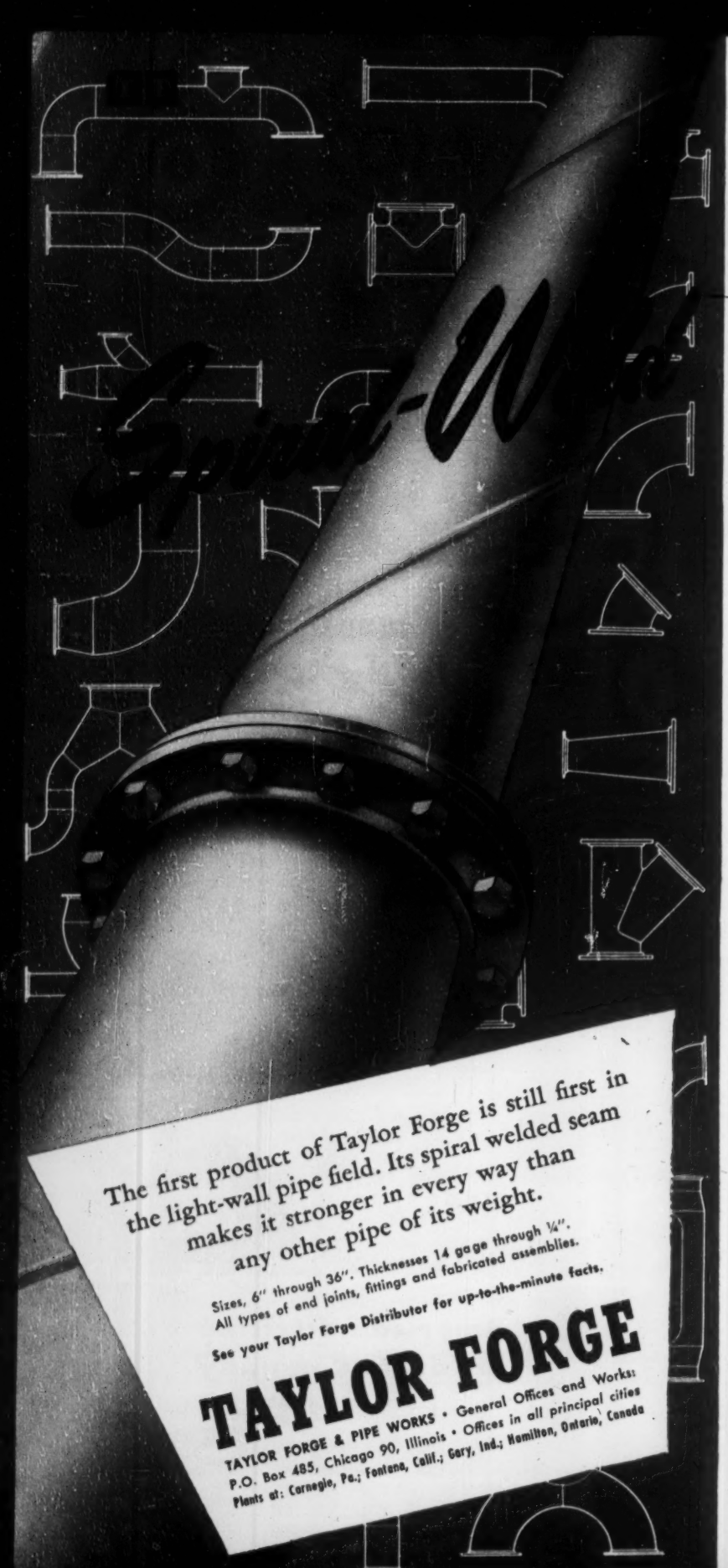

The first product of Taylor Forge is still first in the light-wall pipe field. Its spiral welded seam makes it stronger in every way than any other pipe of its weight.

Sizes, 6" through 36". Thicknesses 14 gage through ¼".
All types of end joints, fittings and fabricated assemblies.

See your Taylor Forge Distributor for up-to-the-minute facts.

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Plants at: Carnegie, Pa.; Fontana, Calif.; Gary, Ind.; Hamilton, Ontario, Canada

Taken in 1905...

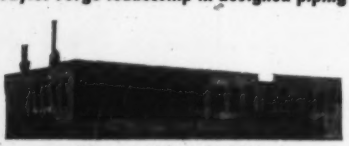
This faded photo was snapped five years after Taylor Forge started back in 1900. That line-up of old timers were putting on a convincing demonstration of the first Taylor Forge product—"Taylor's Spiral Riveted Pipe."

The clothing and hat styles may be dated, but not the pipe. Taylor Spiral Pipe (now welded instead of riveted) then was, and still is, the strongest pipe of its weight.

But while the pipe itself proved revolutionary, the only flanges then available for it—cast iron flanges—were not up to the standard of the pipe. The iron flanges often cracked and caused trouble...and since Taylor Forge couldn't *get* better Flanges, Taylor Forge decided to *make* better flanges.

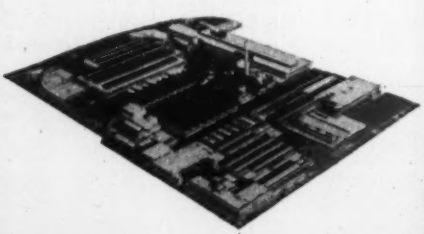
So in that long-ago Taylor Forge set up facilities for making forged steel flanges. It was a pioneering step ...the first time forged steel flanges had been made on a commercial scale. It was also a turning point...for it marked the transition from simply making pipe into the field of *designed* piping.

An episode in the story of Taylor Forge leadership in designed piping



We started here in 1900.

One of the five Taylor Forge plants of today is shown below.



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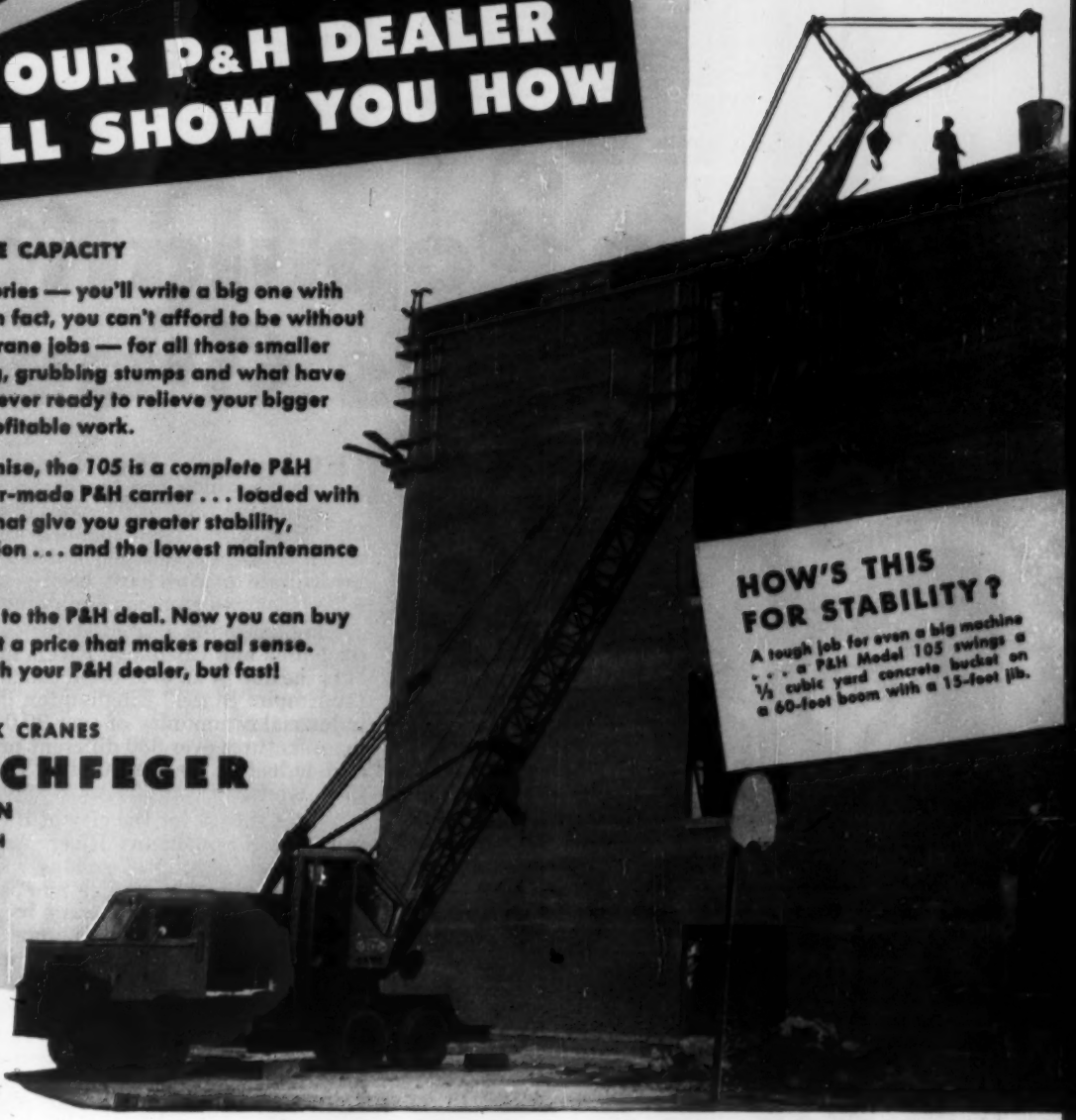
HOW'S THIS FOR STABILITY?
A tough job for even a big machine . . . a P&H Model 105 swings a ½ cubic yard concrete bucket on a 60-foot boom with a 15-foot jib.

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Your P&H Dealer has the experience, the organization and the facilities to serve you reliably in every way. He's ready to deliver the kind of on-the-ground service that keeps your jobs moving on schedule. Your P&H Dealer is tops in the business. Get to know him.

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Allis-Chalmers Helps Binghamton

WATER

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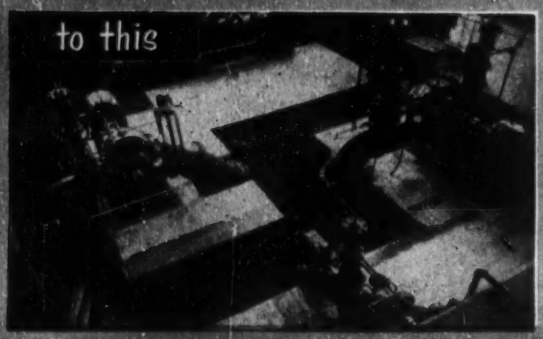


TOP: Portion of pump room before conversion. Photograph shows old type pumps and steam engines used for pumping raw water. Notice crowded condition in this view.

BOTTOM: Same view after conversion, showing four Allis-Chalmers pumps for pumping raw water to mixing chamber — two 11,000,000-gpd, one 15,000,000-gpd, and one 3,200,000-gpd unit.

To keep ahead of rapid population and business growth which has increased average daily water pumpage 1,500,000 gallons in two years, Binghamton, New York, has expanded and modernized their water works facilities. Old, outdated steam engines and inadequate pumps have been replaced with modern Allis-Chalmers municipal pumping equipment.

Binghamton is located at the confluence of the Susquehanna and Chenango Rivers in upstate New York. It is the hub of an area often called "An Empire Within the Empire State." Binghamton itself is an important industrial community of over 90,000 population which manufactures over 330 different products for the home and industry; its surrounding area is rich in fertile farm lands.

Water supply for the city of Binghamton is secured from the Susquehanna River. An average daily consumption of 9,516,846 gallons was recorded in 1953. Allis-Chalmers centrifugal pumps are used in every pumping operation, and vary in size from small 200 gallon per minute reservoir pumps to a large 15,000,000 gallon per day unit pumping raw water into the mixing chamber of the filter plant.

When *your city* plans expansion or modernization of water works facilities, do as Binghamton and other progressive communities are doing — take advantage of Allis-Chalmers many years' experience in municipal pumping equipment. Call your nearest A-C sales office for complete information, or write Allis-Chalmers, Milwaukee 1, Wisconsin.

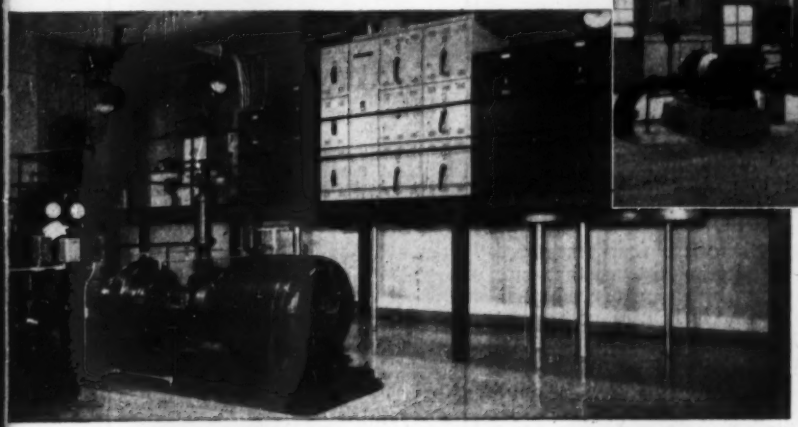
A-4352

ALLIS-

Modernize and Expand Water Works

An aerial look at Binghamton, New York, located at the confluence of the Susquehanna and Chenango Rivers. City covers an area of 9.38 square miles and has a population of over 90,000.

View of pump room, showing 12 by 10, 10,000,000-gpd Allis-Chalmers centrifugal pump and Allis-Chalmers switchgear and motor controls. Power for plant is supplied from three 500-kva Allis-Chalmers power transformers.



Two 14 by 12, 10,000,000-gpd Allis-Chalmers centrifugal pumps forcing clear water into distribution system. Four pumps feed 149 miles of water mains. Excess water is distributed to five reservoirs.

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SIKA STOPS LEAKS FAST

...AND SIMPLY, TOO...

Sika can seal leakage through any concrete structure against pressure. The Sika method is quick, sure and long-lasting.

Here is all you do.

1. Hack and clean surface.
2. Mix quick-setting Sika liquid and portland cement.
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4. Use Sika No. 2 mortar (sets in 20 seconds) to plug bleeders.
5. After sealing all leaks, apply a protective cement coat over entire surface.

For 30 years Sika compounds and methods have helped solve concrete and masonry problems ranging from the production of high quality concrete to the sealing of joints or cracks subject to severe movement and pressure.

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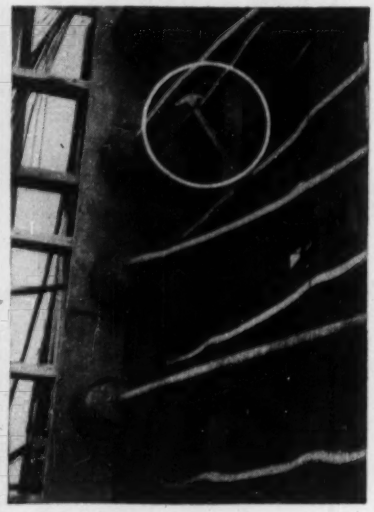


Safety lesson

SIR: The article and photographs shown on pp. 32-34 of your May 20 issue, covering the construction of a concrete tank using prestressed concrete, is very interesting and informative.

However, on p. 33, the second photograph down on extreme right side has the writer wondering how far the hammer may fall and who might be in the right spot at the wrong moment.

E. W. PHILLIPS
Chief Engineer,
Central Alloy District
Republic Steel Corporation

Hartford deserves credit

SIR: The report on the new Statler Hotel in Hartford, Conn., and your editorial on the "Building code paradox" (ENR June 10) were very interesting. Unfortunately, the situation referred to is true in too many instances. However, the situation is not hopeless.

Today there are four recognized building codes in existence that have been written by groups of well qualified men, who had no interest except to write a code that would allow safe buildings without resorting to unnecessary specifications. The majority of states already have passed legislation to allow these and other codes to be adopted by reference without the expense of printing the entire document. By such procedure, local pressure groups do not exert the same influence as on local code writers. It is therefore unnecessary and unrealistic for any municipality, from the smallest to the largest, to handicap the inspectors, contractors, architects and engineers with antiquated provisions in a poor code.

In the case of the Basic Code promulgated by the Building Officials Conference of America, any municipality can obtain qualified assistance in drafting adopting ordinances for this code, by simply writing BOCA at 51 E. 42nd St., New York 17, N. Y. I am sure that the other code committees also offer the same service. It might also be of interest to know that through the efforts of the Joint Committee on Building Codes, made up of representatives from each of the four recognized code committees and the HHFA, the four codes are fast approaching uniformity, and it is not unforeseeable to have one set of regulations for the entire country in the very near future.

Hartford is very fortunate to have a building commissioner with the same ability and common sense approach to the problems of interpretation of code requirements as those who have written these recognized codes. I believe that he should be congratulated and given credit, because without his permission the Statler Hotel could not have been built in this city.

JOHN E. RYAN
Director
Dept. of B'ldg & Safety Engr'g
Ann Arbor, Mich.

CALENDAR

Conference on new developments in engineering design, Virginia Polytechnic Institute, Blacksburg, Va., Aug. 4-6.

National Council of State Boards of Engineering Examiners, annual meeting, Hotel Saint Paul, St. Paul, Minn., Aug. 26-28.

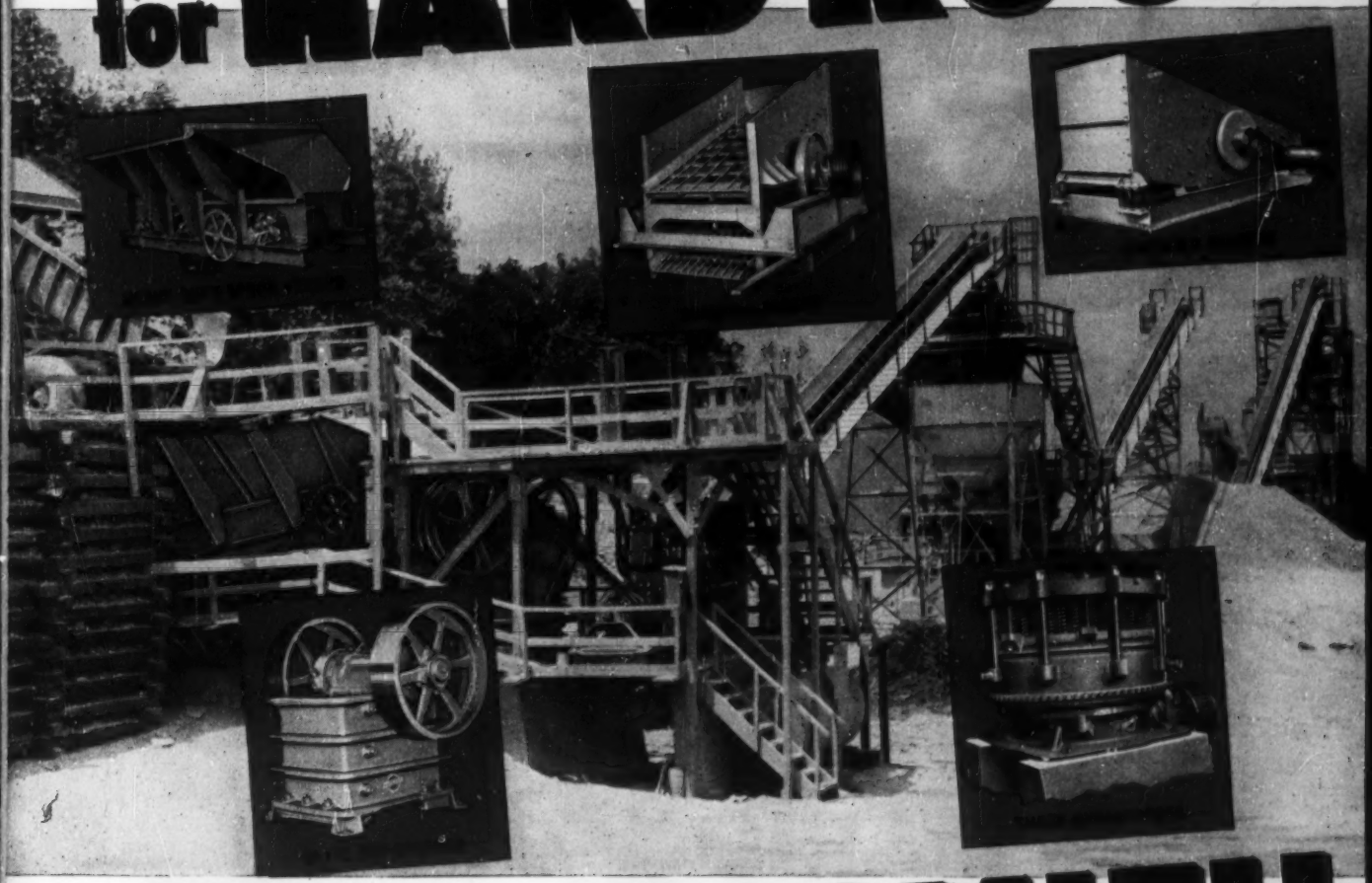
American Water Works Assn., fall meeting, Montauk Manor, Montauk, N. Y., Sept. 9-10.

New England Water Works Assn., Dixville Notch, N. H., Sept. 13-15.

National Highway Conference of County Engineers and Officials, ARBA, Deshler-Hilton Hotel, Columbus, Ohio, Sept. 13-15.

Society for Experimental Stress Analysis and International Congress and Exposition: Bellevue-Stratford Hotel, Philadelphia, Pa., Sept. 21-23.

for HARD ROCK



TELSMITH

Equipment in this Plant

- 42" x 12' Heavy-Duty Apron Feeder
- 30" x 42" Jaw Crusher
- 4' x 10' Heavy-Duty Scalper Screen
- 48-S Gyrasphere Crusher
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Q-27

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IN FEATURES

This 111-M Diesel dragline owned by Palisades Contractors of Irwin, Idaho is working on the Palisades Dam on Snake River in Eastern Idaho. Palisades Contractors is a joint venture of the J. A. Jones Co. and Chas. H. Tompkins Co. Palisades is the biggest earthfill dam undertaken by the Bureau of Reclamation.

MARION 111-M

If you want REAL economy in your excavating costs, year after year — if you want machinery investment dollars to pile up profits long after the cost has been amortized — if you want, at no extra cost, the power and stamina that gets big jobs done ahead of schedule, you want a MARION 111-M. Here are features that literally PAY FOR THEMSELVES and earn EXTRA PROFITS for you. Don't buy a 4-yard machine without getting ALL the facts on the MARION 111-M.

STRENGTH— How strong? Strong enough to exceed the maximum strains and shocks in the hardest digging — reserve strength for troublefree operation over the years. Fewer work stoppages mean more profit for you.

POWER— How much power? Enough to make a 4-yard dipper perform the way you have a right to expect, whether the bank is shot rock or hard clay. Compare ball pull and hoist and drag speeds before you make final decisions. Power, properly applied, means more profits.

ELECTRIC SWING — Electric swing on a diesel machine gives you a new concept of speed, smoothness and accuracy in spotting the load. No swing clutch adjustments — no overheating — no jerking strains and shocks. Fast, smooth swing is the key to faster cycle time — and the key to extra profits.

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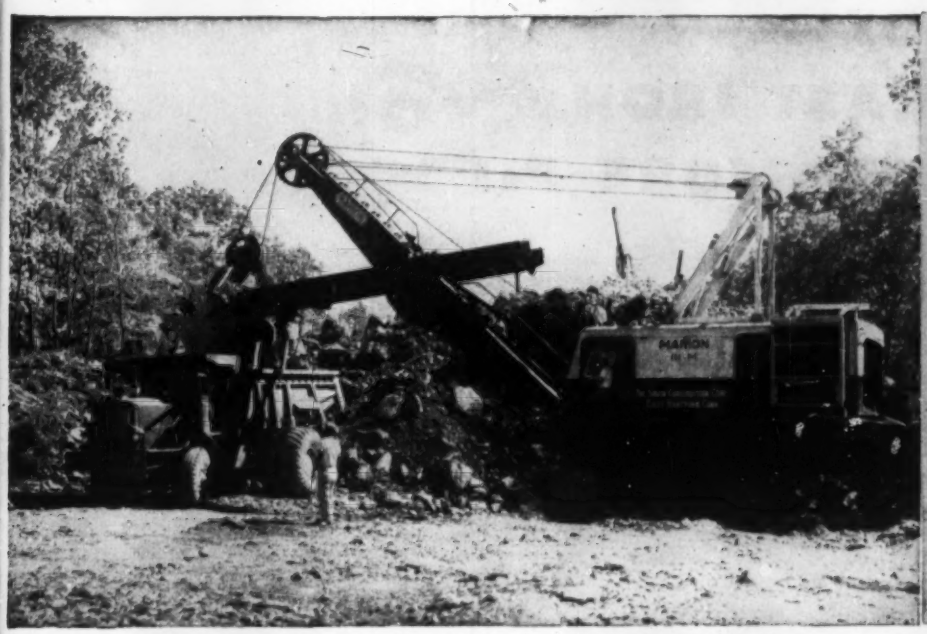
FIELD-PROVED — Nearly a decade of experience in all types of work, under every operating condition, is behind today's 111-M. There are no "bugs" or "soft spots" here — just field-proved design and construction that mean profits for you.

THAT MEAN *Extra Profits* FOR YOU!



This MARION 111-M shovel, owned by Savin Construction Corporation, is working on two sections of the Thruway near the Hudson River that involve moving more than 5,500,000 cubic yards, half of which is rock. Unusually rugged terrain is involved in the 22-mile project.

AIR CONTROL — There's a big difference in controls — be sure to see how MARION has developed and refined air control before you buy your next machine. It is smooth, easy to handle, but more important, it is more dependable and free from maintenance care. It can help you to extra profits.

GOOD CRAWLERS — The lowly crawlers can help make or break your excavating profits on big jobs. Here are crawlers you can truly "forget" — they clean themselves, never clog and crawler belt tension adjustments are made easily and quickly. Here is crawler performance that helps boost profits.

DURABILITY — Extra years of hardest, heavy-duty service built into every part of the 111-M give extra profits long after you have written off its cost. Count on durability, dependability—you'll get them.

EASE OF MAINTENANCE — Every part of the 111-M requiring maintenance care is accessible for service. Even partial dismantling for shipment is simplified. Lubrication points are grouped for easy servicing. It takes fewer hours to keep a 111-M in top condition — fewer hours mean greater profits.

ANTI-FRICTION BEARINGS — The only reason for generous use of anti-friction bearings throughout the 111-M is to make it a more profitable machine for you to own and operate. Get the full story on these bearings and how they pay big dividends.

A BIG 4-YARD MACHINE — Calling a machine a 4-yard shovel doesn't necessarily make it so. Analyze the strength, power and performance characteristics behind MARION'S machine ratings. See for yourself how the difference can mean profits for you. Depending on the class of work, some owners use 5 cubic yard dippers on the MARION 111-M.

MARION SERVICE — The service, the help and the make-good that go with every MARION machine are intangible extras — but they are important to you, profitwise, now and in the years ahead. Fast parts service helps meet your needs in the field.

For complete information ask for Bulletin 402-A (diesel power) or 408 (Ward-Leonard electric).

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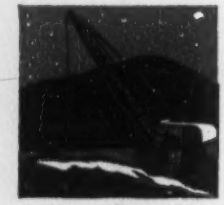

Pipe Installations

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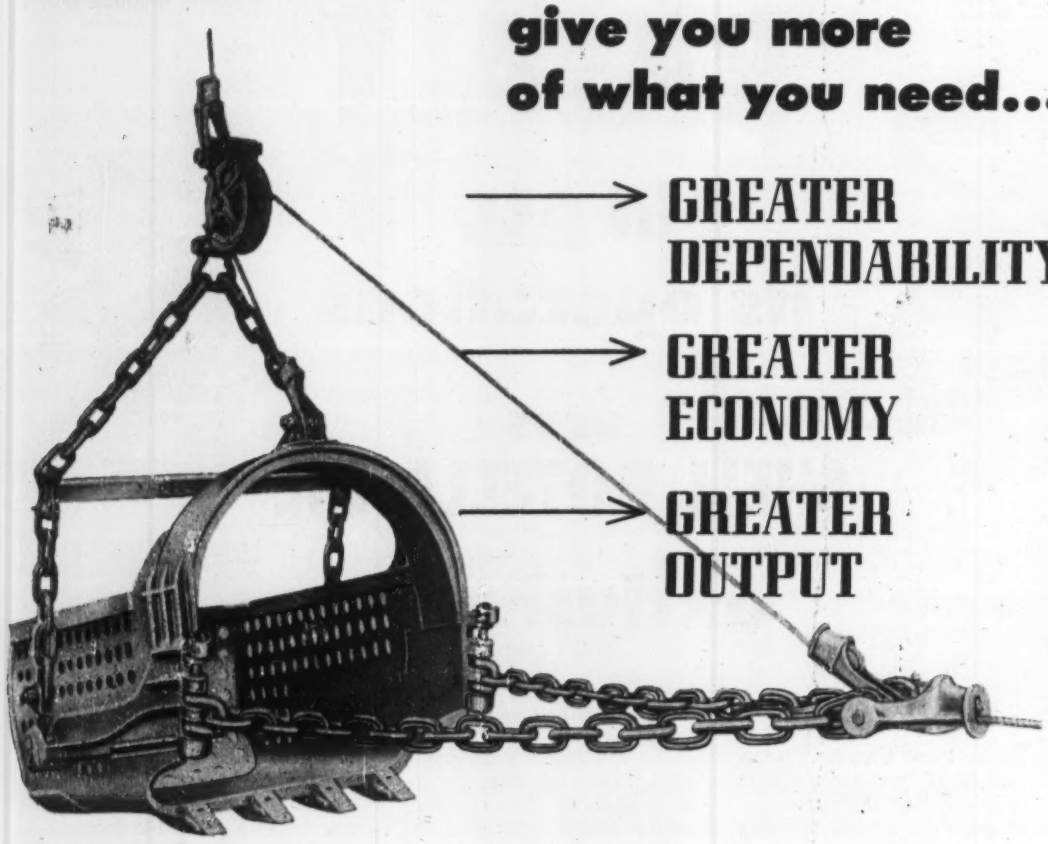

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ENGINEERING NEWS-RECORD

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THE CONSTRUCTION WEEK

FINANCIAL REPORT—Pennsylvania's Turnpike Commission lent strength to the arguments of toll-highway advocates, with the retirement of $4.7 million more of its bonds.

Said turnpike auditors: Bond retirements of the turnpike system are now more than six years ahead of schedule; bonded indebtedness has been reduced by $261 million since June 1951; remaining debt of the 327-mi system is $186 million; toll revenues in the first six months of 1954 were $22 million.

NO LAW YET—Colorado still hasn't a valid law for licensing architects. A Denver district court threw out a 1953 law as unconstitutional.

There hasn't been an effective law since a group of architects challenged a 44-year-old statute nearly two years ago, and succeeded in having the state courts strike it off the books (ENR Mar. 19, 1953, p. 23). But the law hastily passed by the 1953 legislature is "vague, indefinite and ambiguous" said the Denver court.

State legal advisers probably will appeal to the high court.

ON-TIME PERFORMERS—The American Road Builders Assn., is so pleased with its scheme for getting convention sessions started on time that it will continue the practice this year.

The scheme: award prizes for punctuality. Prizes are donated; the donors get their names on exhibits and in the association's publication.

PAVE A RIVER?—There's increasing support among irrigation farmers for that long-discussed scheme to pave the banks and bed of the Rio Grande.

Growing shortage of irrigation water lends point to the farmers' claim that 200,000 acre-ft of water could be saved each year if the river were paved from Elephant Butte Reservoir to El Paso.

No one really knows how much it would cost to line some 600 mi of river, canals and laterals that would be included—and U. S. officials have never been enthusiastic about the job. But guesses as to cost run up to $50 million.

WATER PLAN—Northeast Ohio industrialists are listening to a conservancy-group plan for a 30 to 40-mi pipeline to bring industrial water from Lake Erie to the Cuyahoga River headwaters. Cost would be about $6 million to supply an area containing 30% of the state's industry (around Akron).

You Can't Beat Steel Pipe for Strength

Bethlehem Tar-Enameled Steel Pipe is widely used for water and sewage service because of its resilience, resistance to shock and corrosion, and leakproof joints. But the most important reason for its popularity is its great strength, which is evident in the chart below.

The chart shows the theoretical working and bursting pressures for various pipe diameters and thicknesses. The pressures shown are based upon the use of steel conforming to ASTM Specification A-283, Grade B, having a minimum ultimate tensile strength of 50,000 psi. When exceptionally severe internal working pressures are encountered, the use of higher strength steel is recommended for greater economy. The nearest Bethlehem office will be pleased to supply complete information.

THEORETICAL INTERNAL PRESSURES OF STEEL PIPE

	1/4 in.			5/16 in.			3/8 in.			7/16 in.			1/2 in.		
DIAM	WT LB/FT	MAX WRK PRESS PSI	MIN BURST PRESS PSI	WT LB/FT	MAX WRK PRESS PSI	MIN BURST PRESS PSI	WT LB/FT	MAX WRK PRESS PSI	MIN BURST PRESS PSI	WT LB/FT	MAX WRK PRESS PSI	MIN BURST PRESS PSI	WT LB/FT	MAX WRK PRESS PSI	MIN BURST PRESS PSI
18	49	445	1390	61	555	1735	73	665	2080	85	775	2430	96	890	2780
20	54	400	1250	68	500	1560	81	600	1875	94	700	2180	107	800	2500
22	63	365	1135	78	465	1420	93	550	1700	109	640	1985	124	730	2270
24	69	335	1040	86	420	1300	102	505	1560	119	585	1820	136	665	2080
30	86	270	835	108	340	1040	129	405	1250	150	475	1455	170	535	1670
36	106	225	695	130	280	870	155	340	1040	181	395	1210	206	445	1390
42	119	195	595	148	240	745	177	285	890	206	335	1040	234	380	1190
48	137	170	520	171	210	650	203	250	780	236	290	910	268	330	1040
54				192	190	580	230	225	695	267	260	810	303	295	925
60				214	170	525	255	200	625	296	235	730	336	265	835
72							309	170	520	359	195	605	408	220	695
84							357	145	450	412	170	520	470	190	595
96	The recommended minimum wall thickness is approximately the pipe diameter divided by 165. Pipe having this diameter-thickness ratio, when backfilled and properly tamped, will withstand any depth of cover. For buried pipe, the recommended minimum thicknesses are shown immediately above heavy black line.									470	145	455	539	165	520
108													*611	150	465
120													*669	135	415

*Under certain conditions stiffeners may be required to reduce deflections.

$$P = \frac{t \times Ts}{r}$$

P = internal pressure, psi
t = thickness, in.
Ts = allowable unit stress = 60% x 27,000 (yield point) = 16,000 psi
r = radius of pipe, in.

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BETHLEHEM STEEL

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WASHINGTON OBSERVER

The asphalt vs. concrete squabble in the Air Force is continuing. A recent directive by a special House committee that no differential be given concrete over asphalt in Air Force runways (ENR June 31, p. 22) has not proved a solution. Assistant Secretary of Defense Floete has asked the National Research Council and the National Academy of Sciences to make a six-to nine-months' full-dress study of the controversy. Meantime, Floete says the Air Force must "comply" with the congressional report.

•

Time is running out on the Upper Colorado River water storage project. Congressional leaders are driving hard for an end of July adjournment, and a lot of legislation will have to be sidetracked if the date is met. Upper Colorado is thus vulnerable.

A Senate committee approval of the project is expected. And Sen. Eugene Millikin is confident he can take the measure to the Senate and get it voted. Sponsors hope this success will put enough pressure on House leaders to get the bill up for House debate, and vote.

Nine new plans were added to the project in hearings that opened Monday. Sen. Ed. Johnson of Colorado, now running for governor, seeks to add these, all in Colorado—Dolores, Gunnison River, Cliffs Divide, Crystal River, Trappers Lake, Meeker, Upper Bear, Juniper Reservoir and Savery-Pot Hooks.

But opponents still have the weapon of delay. They expect "conservationist" opponents to require Millikin's Interior subcommittee to take more than the scheduled three days in hearings. And then will try to stretch out debate in the Senate.

And they're still boasting the House will finally defeat the bill. Ex-President Herbert Hoover is expected to give the opponents new ammunition. His Hoover Commission task force on water resources is finishing up public hearings now. And either Hoover, or some spokesman close to him, is expected to be enlisted by the opposition.

•

A $100-million appropriation for building warehouses for military machine tools has finally got through Congress. It comes in the so-called Vance Plan program for reserve tools and facilities, and most will be used for building special de-humidified warehouses.

Warehouses will be built adjacent to defense plants—those which have used the tools on defense orders and would use them again in an emergency.

•

Small suppliers in the construction industry soon will be brought under the unemployment compensation law. The House Ways and Means Committee has approved legislation, which Congress is bound to vote, bringing all employers of four or more employes under the jobless pay program. Heretofore the minimum was eight employes. Eisenhower had wanted the number dropped to one, but the committee demurred.

•

Construction of Niagara power facilities is now remote. It's because of a dispute between private and public power groups in Congress. Neither side will back down from its own position: (1) that the development should be done by five New York private utilties, (2) that it should be done by the New York Power Authority. The House supports the first, the Senate Public Works Committee the second—and no agreement is in sight.

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New Fiberglas Low Pressure Pipe Insulation is priced right in line with ordinary insulations!

Which means that for any given installation it's actually cheaper. For thanks to higher efficiency, Fiberglas Low Pressure Pipe Insulation does the same insulating job as thicker, old-type insulation on hot piping—and it lasts and lasts. The properly located vapor barrier (on the outside of pipe insulation) helps avoid condensation, adsorption and resultant corrosion of pipe and deterioration of insulation.

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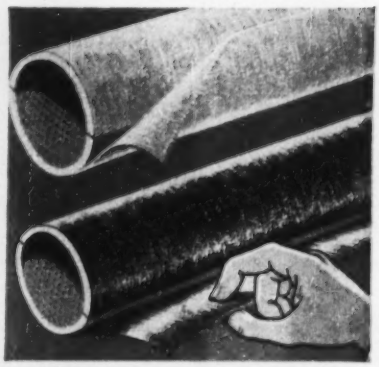
Full information is now available in a new 4-page technical bulletin. To get your free copy immediately, mail the coupon now!



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Federal construction: $6-billion year in view

Congress ups funds for flood control and reclamation; spending cut on military projects, public housing loans

Appropriations for construction already approved by the two houses of Congress indicate that federal construction expenditures in the twelve months ahead will come close to $6 billion, about half a billion less than the amount expended during the fiscal year ended June 30.

Biggest cuts in federal construction spending will hit military building programs. Army construction will be down $100 million and Navy construction $130 million. Public housing loans will be reduced by $200 million. Other major reductions are scheduled for TVA—down $68 million—and AEC—down $55 million.

Outside these areas federal spending on construction should hold close to the current level. In the first four appropriation bills it approved, Congress actually voted slightly more money than President Eisenhower had requested. There will be almost $22 million more for flood control and navigation than last year and about $10 million more for the Bureau of Reclamation (see table on page 22).

The four bills on which Congress has completed action are the important Army civil functions bill, the independent agencies bill, the Agriculture Department bill, and the Interior Department bill.

• **Vote near on several bills**—Final congressional action also is near on the appropriation bill for the Departments of State, Justice and Commerce. This bill provides funds for the Bureau of Public Roads and includes $500 million for federal-aid highways, $15 million for forest highways, $1 million for the Inter-American Highway, $1 million for the Rama Road in Nicaragua and $300,000 for the U. S. Mexican International Boundary and Water Commission.

House-Senate conferees are reconciling this week the two versions of the fiscal 1955 appropriation bill for the Departments of Labor and of Health, Education and Welfare. This measure carries $75 million for construction grants to local hospitals and $70 million for building schools in defense impact areas. The two houses will pass the final bill soon after the conference committee makes its report.

Likewise in conference this week is the District of Columbia Appropriations Bill for the fiscal year starting July 1. Enactment by Congress will authorize capital outlays by the District government of more than $40 million in the next 12 months.

Awaiting action by Congress is an appropriation request from the President for $1.1 billion to finance military and Naval public works. Congress will enact the requested supplemental appropriation after passing the two authorization bills. The House has approved the first, providing $875 million of new authorizations and some $400 million of reprogramed projects. And the House Armed Services Committee was expected this week to make a report on the second, authorizing $350 million of housing on military posts.

Another supplemental appropriation – requested by Eisenhower in June—is still to be acted upon by the House Appropriations Committee. This request proposes: $22 million to revive the federal-aid airport program on a new basis; $6 million to expand helium production facilities of the Bureau of Mines, the only producer of this gas; and $5 million additional for the Inter-American Highway—to strengthen our ties with Latin America. Airport aid would be granted in accord with Administration measures now before both houses, concentrating on airports of national importance and eliminating assistance for terminal buildings.

• **Agreement on lease-purchase**—In addition to appropriation bills, the long-awaited lease-purchase measure for installment buying of government buildings also generate new federal construction. House-Senate conferees finally got together last week on a report that seems to overcome all difficulties (ENR June 17, p. 24). They found a way to meet the constitutional objection of the Attorney General to the original Senate proviso requiring approval by congressional committees for lease-purchase contracts entered into by the General Services Administrator and the Postmaster General. The revised version says only that appropriations to pay the contract amounts must be approved by both Public Works Committees.

Limitations on the first year's lease-purchase operations also were raised

(*Continued on page 22*)

Air Force to rush Academy project

The U. S. Air Force is preparing to move fast to get construction under way on its $126-million Air Force Academy near Colorado Springs, Colo.

This week Air Force Secretary Harold E. Talbott appeared before the House Appropriations Committee to ask for $26 million for preliminary work. He is expected to request an additional $50 million early next spring.

The U. S. Air Force Academy Construction Agency, headed by Maj. Gen. L. B. Washbourne, who also is director of Air Force installations, will use part of the first funds available for an aerial survey of the 15,000-acre site selected last week for the Academy. Completing the topographical surveys will take until September, at least.

By that time, the agency hopes to have selected an architectural-engineering firms to design the academy.

More than 230 applications for this job already are on hand. The agency hopes to be able to make its selection within the next 60 days.

Secretary Talbott must approve the selection.

The academy construction agency is planning to complete the drafting of specifications by the time the architect-engineer for the project is named so that both the specifications and the topographical data on the site will be available to begin work immediately.

No serious land acquisition problems are anticipated, as most of the site is government-owned. The site is crossed by two railroad lines and one super-highway.

A study is already under way to determine whether one or more of these should be re-routed.

Actual construction is expected to get under way in the spring of 1955. Roads, sanitation facilities and water mains will be built first. The Academy is expected to graduate its first class in the spring of 1958.

The federal construction funds now agreed upon

Project	Fiscal '54	Fiscal '55
	(Millions of dollars)	
Army Civil Functions		
Flood control and navigation	$287.7	$300.4
Mississippi River flood control	51.4	45.4
Niagara remedial work	1.5	2.0
Independent Offices		
AEC plant and equipment	166.0	110.9
TVA	188.4	120.0
VA hospitals	17.5	47.0
HHFA slum clearance grants	20.0	39.0
NACA research facilities	7.2	4.6
Agriculture		
Forest roads and trails	14.5	16.0
Flood prevention	7.0	7.5
REA electrification loans	135.0	135.0
REA telephone loans	75.0	67.5
St. Lawrence Seaway	....	10.5
Interior Department		
Bureau of Reclamation	$116.3	$126.7
Bonneville	38.9	24.3
Alaska—public works	12.0	9.5
Roads	14.6	8.0
Railroad	8.8	2.9
Virgin Is.—public works	1.1	....
Bureau of Indian Affairs	15.9	7.7
National Park Service	13.9	8.1
Bureau of Land Management	2.0	2.5
Other Interior	0.9	0.3

by the conferees above the ceilings set by the Senate. The new version allows GSA to contract this year for annual payments up to a total of $5 million and the Post Office Department up to $3 million—or $8 million in all for the two agencies. That much in annual payments would mean about $80 million of new buildings erected by private builders for government use.

In addition, the Post Office could also contract for postal buildings on newly authorized 30-year leases. Actually, however, it is doubtful that the two agencies could contract for even $80 million of specially designed new buildings in the first year.

• **Public housing issue**—Another good prospect for federal bolstering of building construction is tied up with conferences that got under way this week on the housing bill. The Senate voted the Eisenhower program of 35,000 public housing units a year for four years after the House had rejected public housing completely. House conferees finally were allowed to go to conference without definite anti-public housing instructions, but only after the House was assured it would have another crack at any government-subsidized housing that might show up in the report of the conference committee.

Public housing in the amount of about 35,000 units a year is likely to be approved ultimately by Congress.

Whatever finally happens to that part of the bill, the liberalized credit terms already assured in other portions of the measure are designed to stimulate general residential building activity and all the forms of commercial and public work that go along with it.

Senate investigation of the housing scandals started up again this week and is running concurrently with conferences on the housing bill. Revelations of the investigators may act as a brake on any tendency of the conferees to loosen Senate-imposed restrictions on rental housing and home improvement loans.

• **New project plans advance**—While Congress pushes ahead on the essential money bills that must be passed before adjournment, it is at the same time shoving steadily forward a group of authorization measures that will lay the foundation for future construction.

Action is still expected at this session on a big omnibus authorization bill for flood control and rivers and harbors. House Public Works subcommittees have been holding hearings for months. So far, they have approved some 25 flood control projects estimated to cost more than $260 million, plus about 80 navigation projects and more than 20 beach erosion jobs.

NATO projects

U. S. bidders are given initial guidance from Department of Commerce

The Commerce Department last week took steps to familiarize U.S. construction firms with eight North Atlantic Treaty Organization projects for which bids are to be advertised soon in Italy, France, Holland and Denmark.

It was announced that complete details on these projects will be made available by the Department of Commerce field offices. Meantime, it is suggested that U.S. bidders signify their interest and qualifications by contacting the foreign procurement offices.

These offices are: for Italy: Ministero Difesa-Marina, I Direzone Generale Del Genio Militare par la Marina, Via Flamina, Rome; for France: Secretariat d'Etat aux Forces Armees—"Air"-Service de l'Infrastructure, 24 Blvd. Victor 15th, Paris, 15; for The Netherlands: Verbindingsdienst Koninklijke Luchtmacht, 118 Stadhouderslaan, The Hague; for Denmark: Soarnets Bygingedistrikt, Holment, Copenhagen.

Prospective U.S. bidders are requested to give the foreign procurement offices information on comparable jobs they have done for U.S. agencies. A copy of these communications should be forwarded to the Commercial Intelligence Division of the Department of Commerce in Washington.

Here are the eight NATO projects on Commerce's initial list:

(1) Underground shops at La Spezia, Italy. Estimated cost, $546,000.

(2) Underground power station at La Spezia, Italy. Estimated cost, $638,000.

(3) Heating plant and pipeline for underground petroleum storage, Cagliari, Italy. Estimated cost, $800,000.

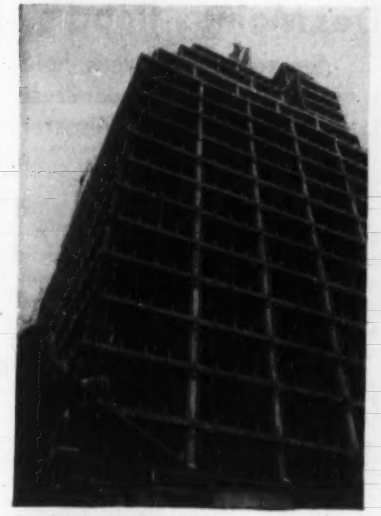
(4) Three maintenance aprons and three dispersal areas providing 48 hardstands at Peronne, France. Estimated cost, $1,680,000.

(5) Airfield fuel storage installation construction, Colmar, France. Estimated cost, $280,000.

(6) Strengthening of shoulders at Marville Airfield, France. Estimated cost, $523,600. (Communicate with French organization by July 9.)

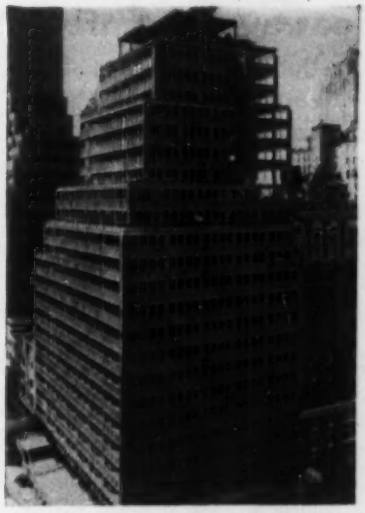
(7) Miscellaneous work at eight airfields in The Netherlands. Estimated cost, $512,400.

(8) Breakwater, quay walls, 2 shelters, dredging and filling at Frederickshaven, Denmark. Estimated cost $3 million. (Communicate with Danish organization before July 22.)



6 AM Whistle starts work on facade of 22-story New York building.

1 PM Aluminum panel is swung into place from 12th floor.



4 PM Two sides are enclosed with 700 panels; the rest will be brick.

How a skyscraper was enclosed in 10 hours

Prefabrication, shrewd advance planning, painstaking make-ready and adequate skilled labor lay behind the successful enclosure on June 21 of two street sides of a 22-story office building in a little less than 10 hours.

Work on the facade of the steel-frame skyscraper, at 460 Park Ave., corner 57th St., in New York City, started at 6 am, and shortly before 4 pm the last of 700 aluminum panels was bolted in place (ENR June 24, p. 28).

• **Two-story panels**—Prefabricated in a factory, complete with window frames, the panels are similar to those used for a skyscraper at 99 Park Ave. last year (ENR Aug. 13, 1953, p. 43). Weighing 200 lb apiece, they are 4½ ft wide and 23 ft high, enabling two stories to be enclosed at a time. Thickness of the metal is only ⅛ in. Aluminum panels also were used to cover the structural steel columns.

Each panel contains two reversible, vertically pivoted 6-ft-high windows, designed to rotate to permit cleaning from inside the building. Below each window is a four-faceted depression, die-pressed on the spandrel to provide an attractive pattern as well as to improve strength.

For weather tightness, each panel is equipped with an integral flange, which interlocks with adjoining panel flanges, eliminating the need for calking. Stainless steel weatherstripping around each window further reduces the chances of water penetration and cuts down air leakage, and thereby reduces the strain on the air-conditioning system.

All panels are surfaced with a 5% silicon-aluminum alloy on the outside. This gives the curtain-wall exterior a gray tint that cuts down glare. In contrast, window frames are polished aluminum. On the inner side, asphalt coating was applied in the factory to the spandrel portion in order to absorb sound.

Behind the aluminum panels will be a 4-in. cinder-concrete block backup and ¾-in. insulation. The backup is needed to meet fire-resistance requirements of the city building code.

The penthouses, which contain machine rooms, will be kept open until all the equipment is installed, after which they too, will be enclosed in aluminum. The two sides of the building not fronting on streets will be faced with brick.

• **Four crews do the job**—Erection of the aluminum facade started promptly at 6 am on June 21 with a whistle signal. In preparation, panels had been stored on every floor near the points of installation, and steel angles had been attached to the building frame to hold them permanently in place. Pulleys were anchored to spandrel beams just below each setback of the building, to support the panels as they were moved into position, the workmen operating at all times from the building floors. No exterior scaffolding was needed.

Work started simultaneously with two crews placing panels near the bottom of the building and one at the bottom of each of two setbacks. Each crew was composed of five men. The four crews had the assistance of 20 helpers.

Supported by ropes from the pulleys, the panels were swung out from the floor on which they had been stored, caught by two men on the floor above and guided to position. Interlocked with adjoining panels, flashed at the bottom to prevent water from getting into the building, the units were bolted to the angles along the edge of the floors. Installation was coordinated and controlled with the aid of a paging and communication system between the construction superintendent at street level and all other floors.

The panels are estimated to cost about $6.50 per sq ft in place. They were fabricated and installed by General Bronze Corp. Tishman Realty & Construction Co. is the general contractor and owner of the building, which will provide 220,000 sq ft of rentable area. Emery Roth & Sons, of New York City are the architects.

Colored aluminum facade

Installation will start next week on a curtain wall composed of colored aluminum panels for an office building in Cincinnati to house the district sales office of the Aluminum Company of America. Panels on the front of the building will have a gold-colored anodic oxide finish, while those on the rear will be colored deep blue.

Paul Schell, of Pittsburgh, is the architect for the $500,000, two-story, 134x51-ft building. Erection is being handled by Frank Messer & Sons, Inc., for Warwick Realty Co.

Seaway appointee

Duluth banker to head corporation; EJC urges engineers for board

Lewis G. Castle, president of the Northern Minnesota National Bank, Duluth, Minn., has been nominated administrator of the St. Lawrence Seaway Development Corp. by President Eisenhower. Confirmation by the Senate is expected.

Mr. Castle also is chairman of the board of the Duluth-Superior Transit Co. He has been an advocate of the Seaway for years, being chairman of the executive committee of the Great Lakes-St. Lawrence Assn., main supporter of the project.

A deputy administrator still has to be named, also the five-man advisory board.

Last week Engineers Joint Council sent an urgent plea to President Eisenhower urging that at least one engineer be named to this board, which was created under the act recently passed by Congress authorizing U. S. participation in the St. Lawrence Seaway project (ENR May 13, p. 21).

The American Society of Civil Engineers already is on record as urging the appointment of one or more engineers to the Advisory Board. One of the board's duties, as set out in the Seaway Act, is to review policies established by the corporation, "including policies in connection with the design and construction of facilities."

Members of the board serve on a per diem basis. It meets at the call of the administrator of the corporation, which call must be issued at least every three months.

On May 17, four days after the President had signed the act, T. Carr Forrest, president of the National Society of Professional Engineers, wrote President Eisenhower asking him to name an engineer as either administrator or deputy administrator, and recommending also that at least two of the five-man Advisory Board be engineers.

The State Department is expected to start negotiations with the Canadian government within the next two weeks looking toward agreeing on U. S. participation in the Seaway project, which Canada has authorized as an all-Canadian undertaking.

If agreement is reached, the next step will be designation of an agency to the U. S. part of the work. The Corps of Engineers of the Army is expected to get the nod since Secretary of Defense Wilson has already been assigned to direct and supervise the St. Lawrence Development Corp.

Undertakers underbid

A contractor won out over several undertakers in bidding for the contract to remove more than 300 bodies from the eight cemeteries and private burial plots in the area to be inundated by Folsom Dam.

Nine bids were submitted for the work. The low offer of $51,831.01 was made by William Gross, a contractor of Auburn, Calif. Other bids ranged as high as $240,053.92.

Folsom Dam, a Corps of Engineers' project, is located on the American River near Sacramento, Calif.

Financing is arranged for St. Lawrence power

The Power Authority of the State of New York announced this week an agreement with banks for the temporary financing of its St. Lawrence power project. The National City Bank of New York and the Bankers Trust Co. will advance the state agency $40 million at 1¼% interest for one year, pending permanent financing.

Within the year the Power Authority will sell revenue bonds to be backed by future sale of power from the project. Total estimated cost of the project has been put at $315 million.

Bids on cofferdam construction for the dam at Long Sault are to be asked for within two weeks; work on this initial phase of the project is to begin in August. Other construction contracts should follow right along. Work by the Hydro-Electric Power Commission of Ontario on the Canadian side of the International Rapids will proceed simultaneously. A full report of activities of the New York State Power Authority relative to the St. Lawrence project is to come from the agency Aug. 1.

California county begins "pump tax" on water users

"Pump tax" on water users in the Orange County, Calif., water district will go into effect July 1. Revenue from the tax will be used to purchase Colorado River water for replenishment of underground water supplies in the Santa Ana River Basin.

The initial tax, payable Jan. 31 of next year, will be levied at $3.50 an acre-ft on all water drawn from the basin. The tax will be adjusted each year on the basis of the previous year's experience.

The approximately 3,500 water users in the area will themselves keep track of the amount of water they use that is subject to the tax. Municipal water districts will be taxed on the same basis as individual rural users.

Des Moines flood

Strengthened levees hold against peak flood crest to avert major disaster

Des Moines, Iowa, passed its greatest flood test in history last week.

Although the Des Moines River rose to a record crest of 30.19 ft—nearly four feet above the 26.5-ft crest of the disastrous 1947 flood—this time the levees held and the city escaped damage on anything like the 1947 scale.

None of the levees was topped. A few were undercut seriously, but scores of volunteers, National Guardsmen and city workers blocked leaks with rock and sandbags to prevent destructive breaks.

All major levees held, but one secondary dirt levee in the northern part of the city collapsed, flooding out 75 families.

Much of the flood damage—estimated at more than $500,000—was suffered by industrial plants in one area under 10 ft of water.

John Adams, executive secretary of the Des Moines Chamber of Commerce, credited the successful fight against the record flood crest to forewarning by the Weather Bureau, an excellent organization job by City Manager Leonard G. Howell and his aides, and the work previously carried out to strengthen and improve the levee.

Since the 1947 flood, the Des Moines levees have been raised and strengthened to provide about three feet of freeboard over the highest stages of record, according to Col. Nelson LeClair, Jr., district engineer at Rock Island, Ill.

Colonel LeClair and his staff moved to Des Moines when news of the flood came.

They directed the sandbagging, capping and other work on the levees.

Two projects now in the planning stage eventually will provide complete flood protection for Des Moines and other Iowa cities. Field-level studies are complete for a reservoir at Saylorville, six miles upstream from Des Moines on the Des Moines River, and for the Red Rock Reservoir on Howell-Red Rock Reach, some 55 miles below Des Moines.

Saylorville will provide 225,000 acre ft of flood control storage and 75,000 feet of conservation storage. This will cost $40 million; Red Rock will have 1,800,000 acre ft of storage at a cost of $77 million.

Studies of both projects are under review at the present time by the Chief of Engineers and the Board of Engineers for Rivers and Harbors.

Thin-shell experts exchange "know-how"

Design and construction techniques for cylinders, domes and warped surfaces are discussed at M. I. T. conference

More than 200 architects and engineers gathered at Massachusetts Institute of Technology last week to hear some of the country's most imaginative designers and skilled builders describe their experiences with thin-shell concrete construction. But it was a Mexican engineer, Felix Candela, of Cubiertas Ala, S. A., Mexico City, who stole the show.

Belittling the importance of the mathematical theory of elasticity in thin-shell design—even going so far as to claim that it is now one of the main obstacles to the normal development of structural knowledge—Mr. Candela expounded his theories of the behavior of shells and showed pictures of the daring structures he had designed and built.

• **Learn from nature**—"We may learn from nature," Mr. Candela said, "that its stone shells are always doubly curved. The reason for this fact becomes obvious considering the advantage of avoiding bending moments in petrous materials. . . . Doubly curved surfaces of inextensible material always assume a membrane state of stresses. . . . A membrane, as long as it may be a doubly curved surface built of inextensible material, has an immutable form and will always be in equilibrium without bending whatever its form and load condition. So doubly curved shells can be built as thin as possible. And generally they don't require stiffening ribs.

"This is not the case with cylindrical shells or, in general, developable surfaces," Mr. Candela contended. "They are exposed to important bending moments in directions normal to straight generators . . . therefore, they must be given a substantial thickness, thus losing the right to be considered as proper shells, the essential characteristic of which is the absence of bending moments."

Mr. Candela then pointed out that proper shells develop stresses so low that they can be built with any kind of ordinary concrete, without special or careful workmanship, and in many cases, even without steel reinforcement.

Standard thickness of his shells is 1½ in., a practical minimum not requiring special gravel.

• **Warped surface**—The Mexican engineer finds hyperbolic-paraboloid shapes most interesting from a construction viewpoint. While they are doubly curved surfaces, they are formed by two systems of straight generatrix, which allow the formwork to be composed only of straight timber. Stress analysis does not involve higher mathematics; generally an investigation of the membrane state of stresses is sufficiently accurate.

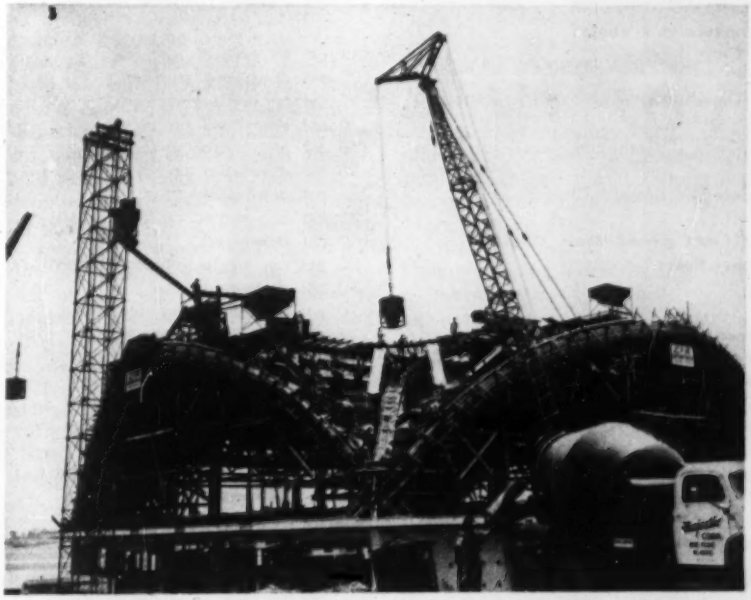
Applications of his theories include a 720-ft-long warehouse for the Custom House of Mexico, D. F., with a central span of 66 ft and two overhangs of 20 ft each. General thickness is 1½ in., increased to 4 in. at the springing. Stiffening ribs are 16½ ft apart, on column lines.

Candela built the Cosmic Rays Pavilion for the University City of Mexico in the form of two hyperbolic-paraboloids coupled along a principal parabola and with a span of 33 ft. This shell is only ¾ in. thick.

He also built numerous hyperbolic-paraboloid "umbrella" slabs, including some in inverted form for footings. One of the most unusual of the umbrellas is a 50x15-ft shell, with a total rise of 5 ft, having unequal cantilevers. The long arm cantilevers 36 ft and is composed of 1½-in.-thick perlite concrete, while the counterbalancing short arm is made of 8-in.-thick stone concrete.

• **Cylinders and domes**—Several other speakers presented design theory for cylindrical shells, which, as Mr. Candela pointed out, are subjected to bending stresses. A. L. Parme, of the Portland Cement Assn., Chicago, explained the design theory given in the American Society of Civil Engineers Manual No. 31, "Design of Cylindrical Concrete Shell Roofs." This manual, containing design tables and charts to simplify stress analysis, is based on corrections to the membrane state of stresses to account for absence of supports along the edges. George C. Ernst, Chairman, Department of Civil Engineering, University of Nebraska, offered an ultimate-load design method for long cylindrical shells, and Eric C. Molke gave simplified methods for short shells.

Dome design and construction also were taken up by several speakers. M. Fornerod, chief engineer, Preload Co., Inc., New York City, said that the membrane theory is applicable to domes except near edge restraints and in exceptional cases where shell thickness exceeds about 2% of the radius of curvature, when the bending theory must be applied. Robert Zaborowski, vice-president, Roberts & Schaefer Co., Chicago, presented design equations for partial domes, point-supported domes and domes subjected to bending because of discontinuities. And John H. Hession, President, National Gunite Corp., Boston, told of constructing domes for tank covers, planetariums and houses, some with spans over 100 ft and only 2 in. thick.



THIN-SHELL CONCRETE ROOF only 4½ in. thick was completed last week for one section of the terminal building at Lambert-St. Louis Airport. Roof consists of intersecting cylindrical shells (ENR Jan. 29, 1953, p. 52).

FCDA offers minimum design standards for atomic age industrial buildings

The Federal Civil Defense Administration has released minimum standards and criteria for designing industrial buildings against atomic blasts. Conformance with these recommendations, FCDA believes, will give structures a reasonable chance of survival at distances of more than ½ mile from ground zero of a 20-kiloton-TNT-equivalent bomb.

The recommended protection would be effective at greater distances from ground zero with more powerful bombs (varying with the cube root of the bomb's power): ¾ mile for a 50-kiloton bomb, 1 mile for a 160-kiloton bomb and 1.8 miles for a 1-megaton bomb.

• **Design criteria**—To reduce the vulnerability of structures, FCDA urges that they be of fire-resistant construction, not more than two stories high, and that they should occupy less than 20% of the site. Buildings should be separated by a distance at least equal to the height of the taller of two adjacent walls.

The general principles of structural design in the FCDA manual, "Interim Guide for the Design of Buildings Exposed to Atomic Blast," TM-5-3 should be adopted, FCDA urges. In addition, FCDA says it is desirable that buildings be kept simple in plan, square or rectangular preferably, and symmetrical in elevation, mass and stiffness. Expansion joints should be provided to prevent movement of one portion of a building from damaging another. Footings of each unit should be interconnected, but connections should not be made between units that will react differently to blasts. Lateral rigidity should be provided by continuity of girders and columns, bracing, and shear walls spaced less than 100 ft apart. And entrances and exits should be adequate in number for emergency use and protected by blast doors or baffles.

• **Blast loadings**—For specifying the degree of protection to be provided, FCDA sets up three classes of construction:

Class I—For protection of personnel and critical equipment.

Class II—For structures housing moderately rugged machinery, equipment or durable goods that will not be damaged seriously by failure of walls or other blast effects, or machinery that can be repaired easily.

Class III—For relatively unimportant structures.

Blast loads for designing these types of construction are given in an accompanying table in the form of substitute static loads. Allowable stresses may be the same as for wind loads. Overturning and sliding effects of a blast should be investigated, as well as lateral resistance of the frame.

Shelters also should be designed to support weight of debris: 200 psf when there are two stories above, 300 psf for three or four stories above and 400 psf for more than four stories above. Protection against radiation should be provided by at least 12 in. of dense concrete or the equivalent. Shelter space should allow 6 sq ft per person.

For protection of utility services, FCDA recommends that consideration be given to alternate or duplicate services, underground installation, zoned design, cut off valves, blast-protective housings, storage of spare parts and emergency equipment.

Minimum design blast loads

Structure as a whole:	
Class I	135 psf on vertical surfaces
	105 psf downward on roof
Class II (masonry)	90 psf on vertical surfaces
	70 psf downward on roof
Class II (frangible walls)	70 psf on vertical surfaces
	55 psf downward on roof
Roofs and floors: Class I	225 psf downward
	225 psf up, neglecting dead load
Roof and ground floor: Class II	100 psf downward
Other floors: Class II	100 psf up, neglecting dead load
	70 psf downward
	70 psf up, neglecting dead load
Structural or protective walls	225 psf either direction
Walls: Class II	No blast loading
Shear walls: Class II	150 psf either direction
Slabs covering stairwells or elevator shafts:	
Class I	350 psf downward
	225 psf up, neglecting dead load
Class II	150 psf downward
	70 psf up, neglecting dead load
Structural elements: Class III	No blast loading

Note: Walls may be considered frangible if the ultimate lateral strength does not exceed 75 psf. Protective or structural walls should have a minimum resistance equivalent to an 8-in.-thick concrete wall of average story height reinforced with ⅝-in. dia bars 6 in. c-c in each face.

Bids on Utah construction are 37% below estimates

Recent bids on major federal and state construction projects in Utah have been running as much as 37% below engineering estimates. Officials say stiff competition for the jobs is responsible for driving bid prices below the carefully prepared estimates.

Lower bid prices in Utah are in line with a nationwide trend that was particularly noticeable in the first quarter, when bids 10% to 20% below estimates were commonplace on all types of public works (ENR April 8, p. 21).

This past week all 16 bids opened for the Davis Aqueduct of the Bureau of Reclamation's Weber Basin project proved to be well under estimates. The low bidder, United Concrete Pipe Co., Baldwin Park, Calif., was fully $2 million or 37.8% below the advance estimate of $6,272,541. High bid on the job was $5,987,981.62—also well below the advance figure.

A week earlier, low bid on the Wanship Dam of the same Reclamation project was $2,243,000 or 32.7% under the estimates. And C. D. Woods, Weber Basin project manager, reported that a job for the Bureau of Reclamation at Eden, Wyo., involving almost $1 million was 25% below estimates.

On the highway side of the picture, the successful bid of Gibbons & Reed Construction Co., Salt Lake City, for a highway widening and dividing strip project on U. S. Highway 91 was $365,071, or 16% under estimates.

Bids $525,000 under estimate

V. N. Holderman and Sons, Columbus, Ohio, contractors, were the lowest of 14 bidders for the job of building a 10-mi superhighway between Dayton and Xenia, Ohio. Holderman bid $3,181,345—$525,000 under the state's estimate of $3,706,300.

Indiana, Kentucky, Ohio coordinate toll road and Ohio River programs

Three governors order joint study of turnpike networks and plans for new dams, locks, bridges on the waterway

Indiana, Kentucky and Ohio, faced with the problem of no planned toll road connections down where the three states meet along the Ohio River, are working fast to tie their turnpike networks together (ENR June 10, p. 21).

Governors Frank J. Lausche of Ohio, L. W. Whetherby of Kentucky, and George H. Craig of Indiana have ordered a joint study by three states of the traffic situation in the area between Cincinnati, Louisville and Indianapolis—the present terminations of planned toll roads leading into the three-state corner. To cover the need for bridges over the Ohio River, the study will search out the possibilities of creating joint bridge authorities and the employment of new high-level dams to act as substructure for such bridges.

The study was ordered at a joint conference held last week which included the three governors and their top lieutenants in highway and river matters.

An increasing amount of river traffic on the Ohio is forcing the consideration of reducing the 46 dams on the river to only 16 through the development of high-level structures. The new dams would save five hours of time at each new lock and they would reduce the cost of transportation on the Ohio by 50%.

• **A new departure**—Pulling together in the first major coordination of interstate toll road planning, the governors want studies made of a Cincinnati-Indianapolis toll road, and a Cincinnati-Louisville link. The route from Cincinnati to Louisville would start from the termination of the planned Conneaut-Cincinnati route in Ohio, swing around into Indiana, and cross the Ohio River into Kentucky on top of a proposed new dam at Markland, Ind. Feasibility of using a new $77-million dam at Markland as substructure for a highway bridge was pointed out at the conference by Col. George T. Derby, Corps of Engineers, district engineer at Huntington, W. Va.

Plans for an extension of Indiana's north-south toll road to run from Indianapolis to Louisville are to be surveyed in the study, as is a St. Louis-Cincinnati toll road advocated by Governor Wm. G. Stratton of Illinois and in which Governor Craig of Indiana has expressed interest.

• **Bypass Cincinnati**—The plan to bypass Cincinnati, in linking Ohio's proposed Conneaut-Cincinnati turnpike with Louisville, Ky., is due to the traffic congestion on the four Cincinnati bridges across the Ohio River. Kentucky has the responsibility of building and maintaining river connections with Ohio and Indiana. The present four bridges at Cincinnati are inadequate for peak demands now, and the burden of constructing new crossings is one Kentucky would like to share with Ohio and Indiana, according to William P. Curlin, Kentucky Highway Commissioner.

Plans for new Ohio River locks and high-level dams to replace inadequate old structures can fit in nicely with a bridge crossing over the Ohio. Col. Derby told the conference that the use of new high-level dams as substructures for highway bridges was entirely feasible. He expressed surprise that highways officials had not shown a previous interest in using the big dams since it would be cheaper to build roads to a dam than to construct a bridge.

The case for new dams on the Ohio is a forceful one. River traffic has reached staggering proportions (equivalent to seven 100-car train loads every day) into and out of the Ohio River. (ENR April 8, p. 26). Locks too small for today's tows on the river consume an hour and a half for each passage, and there are 46 locks in the navigable length of the river. With new high-level dams and longer locks the number could be reduced to 16 locks and the biggest tows handled in less than half an hour. It costs $90 an hour to operate a big tow, Col. Derby pointed out.

Gov. Lausche has recommended that Congress authorize immediate starts on new locks and dams at New Cumberland, Ohio, (a project estimated at $45 million), at Markland, Ind., ($77 million) and at Greenup, Ky., ($65 million). He further recommended that the rest of the locks and dams, 13 more, be expedited as soon as possible. The Corps of Engineers envisions 20 years for the full job, but it could be done in 10 years if funds were available, Col. Derby said.

Illinois hires consultants for toll road surveys

Parsons, Brinckerhoff, Hall and Macdonald, New York City, and Wilbur Smith and Associates, New Haven, Conn., have been retained by the Illinois State Toll Highway Commission to make a traffic-revenue survey on its five proposed toll highways (ENR, June 10, 1954, p. 23). Total cost of the survey will be $275,000, according to Evan Howell, commission chairman.

The survey will be finished about mid-November, which is the target date for completion of the civil engineering survey now being made on the $583-million project by Joseph K. Knoerle and Associates, Baltimore. The two reports are the final steps preceding the selling of bonds, acquiring right-of-way, and the preparation of final designs.

One phase of the traffic-revenue survey, according to Howell, will entail the operation of about 50 traffic-counting stations. Both manual and mechanical counts will be made in these origin and destination surveys on highways paralleling and in the vicinity of the proposed toll highways.

One of the proposed toll routes will form a belt line around the north, west and south sides of Chicago. Three of the routes will extend from this circumferential toll highway north towards Milwaukee, northwest to the Wisconsin state line, and west to the Rock Island-Moline metropolitan area. The fifth route will run from East St. Louis northeasterly to the Indiana line near Terre Haute, Ind.

Property owners file suits to block Florida turnpike

Two court suits have been filed in efforts to block the construction of the proposed 110-mi Florida "bob-tailed" turnpike, from Hollywood (north of Miami) to Ft. Pierce.

One suit was filed in Broward County Circuit Court by a group of property owners; the other, by property owners in Palm Beach County.

Both groups made substantially the same allegations—that construction of the turnpike over the route originally designated for State Road 9 through the two counties would block their westward expansion.

The turnpike authority is pushing preparation of a bond issue to finance the project and working on plans and specifications. Since construction of this section of turnpike was authorized about a year ago (ENR June 11, 1953, p. 25) the engineers' estimate of cost has increased from $62 million to $87 million.

ASEE again urges broader curricula

Means for giving their students a better grasp of the basic engineering sciences, for stimulating their inventiveness while at the same time making them more human, dominated the deliberations of the engineering educators who gathered at the University of Illinois for the recent annual meeting of the American Society for Engineering Education.

Central theme of the meeting was an interim report of the ASEE Committee on Evaluation of Engineering Education, the second to be submitted by the committee. L. E. Grinter, dean of engineering at the University of Florida, chairman of the committee as well as retiring president of ASEE, presented the major recommendations of this report.

The committee set up experimentally a "common stem" for all engineering curricula covering 100 semester hours out of a total of 138 for a 4-year period of instruction. This 100 hours is divided into (1) humanistic-social, 21 hours; (2) math and basic science (about equal weight), 36 hours; (3) engineering science, 36 hours; (4) required technology, 7 hours.

The committee said that the functional purposes of engineering education will be served best by elective courses totaling about one semester, selected in relation to a planned objective.

Dean Grinter said the committee hopes to make its final report in about a year.

• **Shortage of engineers**—Results of a new survey of the engineering needs of nearly 400 companies and government agencies, made by the Engineering Manpower Commission of Engineers Joint Council, were summarized by Donald S. Bridgman, chairman of the ASEE Manpower Committee. These organizations require 8,950 engineers this year as against 11,386 last year, but expect to obtain only 5,560 as against 6,692 obtained last year. This is due to the smaller number of graduates this year.

• **New officers**—Nathan W. Dougherty, dean of engineering at the University of Tennessee, was elected president of ASEE. New vice-presidents are Leo J. Lassalle, dean of the College of Engineering, Lousiana State University, and Harold K. Work, director of the research division of the College of Engineering at New York University.

The Lamme Medal was awarded to Thorndike Saville, dean of the School of Engineering, New York University. The James H. McGraw Award went to Arthur C. Harper, president emeritus of Wyomissing Polytechnic Institute, and the George Westinghouse Award was made to Thomas J. Higgins, professor of electrical engineering at the University of Wisconsin.

Fellowship plan

IRF creates foundation for foreign road students

The International Road Federation has created the International Road Educational Foundation to enlarge its fellowship and training program for foreign highway engineers, according to an announcement made by R. O. Swain, Federation Executive Director, in letters to more than 300 officials of petroleum, automotive, rubber and construction equipment companies which support the foundation.

Since the IRF first brought two students to the U. S. in 1949, it has built the total up to 30. Eight fellowships are active currently. The students have been chosen by IRF associate organizations, which exist in 50 foreign countries. Competitive examinations are used, and candidates must be college graduates in their own countries.

Nine months of study here are followed by 8½ weeks of practical observation of state highway departments and U. S. industry related to road construction and transportation, after which the students return to responsible highway jobs in their respective countries. The U. S. schools used so far in the program are Ohio State, Purdue, University of California and the Yale School of Traffic Engineering.

Fostering the development of efficiency highway systems as the basis for social and economic growth in all countries of the world is the principal objective of the IRF.

The other educational activities of the IRF will continue to be carried on by the federation itself. These include: on-the-job, paid training of foreign engineers as employes of state highway departments in the United States; observation tours in the United States for foreign engineers to study selected state highway departments, construction projects and municipal traffic; lectures abroad by highway authorities; and national training schools in countries abroad to encourage mechanization of highway departments, roadbuilding equipment utilization and the operation and maintenance of it.

Court battle shapes up over Box Canyon Dam job

Alleged failure of Pacific-General-Shea to carry through an agreement to complete work on the spillway of the $16-million Box Canyon Dam in northeast Washington within one 280-day low-water period has led to the filing of a $4,113,000 suit by the Pend Oreille Public Utility District in Pend Oreille County Superior Court at Newport, Wash.

Work on the dam was halted in April, the PUD asserting it had terminated the contract and Pacific-General-Shea declaring it had rescinded it. The PUD since has awarded a contract to Morrison-Knudsen Co., Inc., for completion of the dam.

Pacific-General-Shea, contending changes in specifications made completion of the dam impossible within 280 days, has filed a $3-million claim against the PUD.

Dutch engineer to advise on salt water barrier

Cornelius Biemond, engineer in charge of the Amsterdam water supply and a member of the Zuyder Zee Board and the Dutch Water Conservation Board, has arrived in California to work for two months as adviser to a special board of consultants studying the feasibility of salt water barriers in San Francisco Bay. (ENR Nov. 19, 1953 p. 27).

Biemond said his first impression after a quick look at the area was that the problem was going to be "a very hard nut to crack." He pointed out, however, that the Dutch people discussed their dike problems for 30 years before any concrete action was taken.

Calif. calls for bids on two bridge projects

Bidding has been authorized on two bridge projects in the San Francisco Bay area.

California's Department of Public Works will open bids July 21 for a $3.3-million bridge at Richardson Bay on U.S. 101, five miles north of San Francisco. The 2,863-ft prestressed concrete bridge will provide two 40-ft roadways separate by a 6-ft median strip. The off-ramp roadway is 16 ft wide. Piles are designed for a 225-ton bearing load and bids are being taken on several alternative designs.

The department also approved a bid call for another unit of the $62-million Richmond-San Rafael bridge, including toll plaza and administration buildings. Work on the north bay project (ENR March 4, 1954, p. 30) is about 25% complete.

Compensation

Its cost is reduced for New York builders

New York state's construction contractors took particular pride last week in the announcement (June 25) by the state's superintendent of insurance of a startling 9.8% drop in rates on workmen's compensation insurance.

The state announcement said that the cut in rates will result in savings of about $42.5 million this year to all industry in the state—a large part of it to construction contractors who have been among those who have complained most loudly of the state's high rates. The reduction made will be absorbed largely by agreement with the insurance industry, state officials said, as well as by reduction of costs incident to processing compensation cases.

Building contractors—who participated (with the state's Commerce and Industry Association) in financing and working with a state Moreland Act Commission investigating compensation costs—were singled out by the state commission for special commendation for their work.

Through the Building Industry Employers Association of New York State, the contractors have pledged a total of more than $15,000 to aid in the investigation.

Some idea of the cost of compensation to the construction industry as a whole was contained in a recent study announced by Richard J. Gray, president of the AFL's Building and Construction Trades Department, who said that U.S. construction in one year (1953) paid out a total of more than $700 million for compensation for injuries to its workers.

• **Trouble spots**—In a report to the BIE last week, David Donald, treasurer of the John W. Cowper Co., Buffalo contractors, and chairman of the BIE's participating committee studying compensation, pointed out that studies of three principal sources of compensation peculiar to construction are now undergoing careful medical and statistical study—with an eye toward further savings to contractors.

The problem spots, Donald said, are:

• Lower back injuries—conceded by medical men most difficult to diagnose positively—and the cause of much more lost time than most other forms of injury in construction. Donald said that in 1949—last year for which complete statistics are available—26,600 such cases were reported in the state, involving average lost time varying from 42 to 232 weeks.

• Head injuries.

• Heart cases of all types. The committee chairman reported that in 1949 the cost of the average construction heart case in medical and cash aid had reached $9,400.

• **Hearings cut down**—One thing determined without question in the continuing studies, Donald commented, was that under former procedures, hearings were too many and too costly. He added that in 1952, more than 500,000 hearings were held.

Under recommendations strongly urged by the construction industry, the state now expects to cut the number of hearings by perhaps 40%, through changes in evidence rules and expedition of hearing and other procedures.

State building contractors promised to increase their monetary contributions, and to continue their drive among their own membership (more than 2,500) to aid the state commission in gathering evidence and suggestions for further reductions.

Davis-Bacon

Enforcement is tightened by Labor Department

Labor Secretary James P. Mitchell has put 20 contractors on the ineligibility list for federal construction projects as part of his campaign to tighten up on Davis-Bacon Act and other federal laws affecting government projects.

This statistic is about as good a touch-point as any that the Eisenhower Administration is trying to prove its friendship to the union working man against the almost 100% opposition of CIO and AFL union leaders.

Mitchell has tightened enforcement of the Davis-Bacon Act considerably, and you can expect that he will continue to tighten to the extent that he has men in the field to watch operations.

The Davis-Bacon Act requires payment of prevailing wages on federal projects.

Indeed, one of his subordinates told the South Carolina Federation of Labor convention at Spartanburg, S. C., last week that the workers themselves, could help in the law's enforcement.

Cornelius R. Gray, chief attorney of the Enforcement Division in the Dept. of Labor, said that Mitchell already has seen to it that workers finally got "millions of dollars" of pay due them as a result of enforcement activities.

Gray, son of the president of the Building Trades, Richard Gray, warned that bird-dog investigation of some $11.8 billion of federal construction would continue. He said that enforcement has been decentralized into regional offices, so that violation of Davis-Bacon and similar laws could be easier tracked.

"In the event you know violations are taking place on federal projects," Gray told the workers, "we would appreciate your reporting such violations to us."

And he reiterated that these requirements are mandatory on contractors. They must:

• Classify all laborers and mechanics to conform with the schedule of classifications in the contract.

• Employ apprentices only when such are bona fide and registered apprentices under an approved apprenticeship program.

• Post the scale of wage rates in a prominent place where they may easily be seen by the workers.

• Pay all laborers and mechanics unconditionally and not less often than once each week the full wages earned.

• Pay hourly rates which are not less than those listed for the class of labor being employed.

• Pay a rate of not less than one and one-half times the straight time hourly rate for all hours worked in excess of eight hours per day in those instances where the eight-hour laws are applicable.

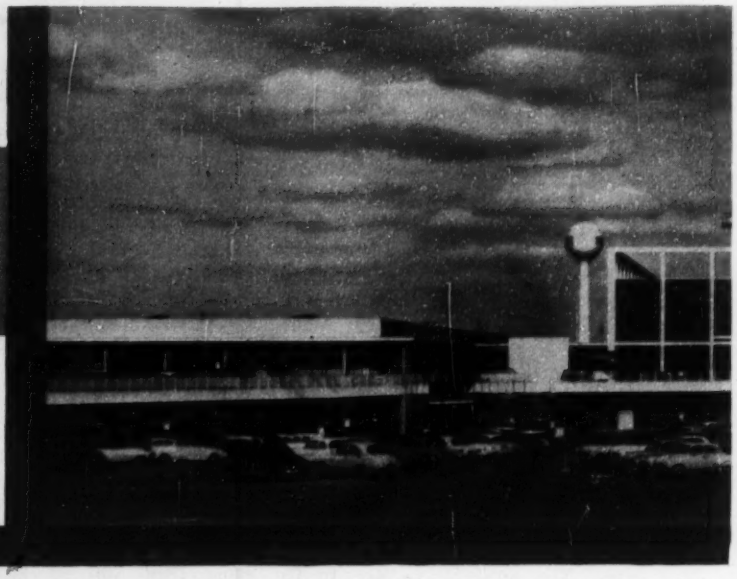
• Make no deductions from wages other than those authorized by law.

• Maintain and furnish pay roll records, certifications, and affidavits as to employment and the payment of wages; and,

• Require the prime contractor to include the basic labor standards provisions of his contract in all subcontracts.

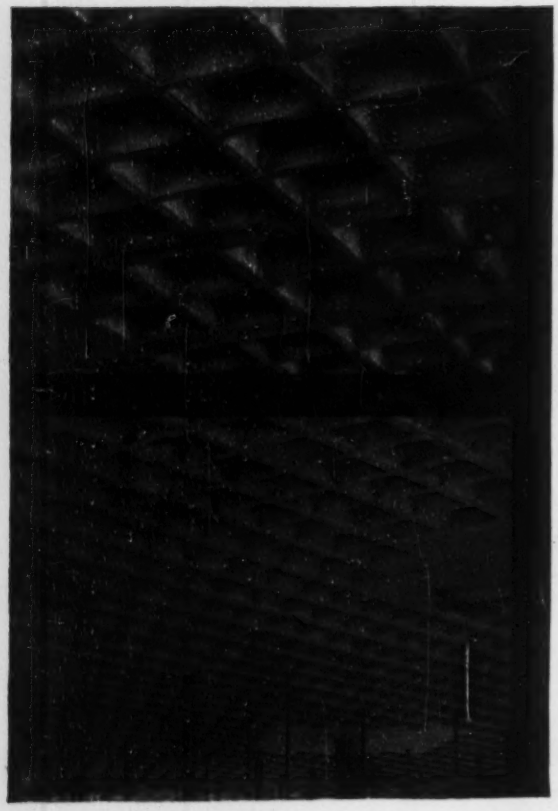
The regulations provide that federal contracting agencies may withhold from contractors sufficient monies to reimburse underpaid workmen. Also contractors may be barred for a period of three years from receiving any federal government contracts for aggravated or wilful violations.

Case history of CECO on-the-job performance



Architect: Victor Gruen Associated Architects & Engineers, Inc.
General Contractor: Bryant & Detwiler Company

waffle construction plus Ceco-Meyer Steelforms



How Ceco methods saved materials

■ When architect Victor Gruen developed the original concept of Northland Center, world's largest shopping district in suburban Detroit, he had an eye for beauty and function. Beauty that would make the center a pleasant and even inspiring place to shop. Function that would make shopping as convenient and effortless as possible.

J. L. Hudson Company's branch department store is the core of the development—and here one of the major requirements was providing the greatest amount of usable space by keeping interior columns few in number and small in size. Typical spans were 29'-1" each way, and a waffle design using 14" deep Ceco-Meyer Steelforms provided a ceiling clear of beams, and kept steel, concrete and dead weight to the minimum. The saving in steel alone was 16% when compared with solid flat slab construction.

In other areas of the Hudson store and in the tenant and the service group buildings, one-way Ceco-Meyer Steelform floor

minus "lazy" concrete equals 16% steel savings

construction accounted for similar steel savings, eliminated "lazy, non-working" concrete, and kept dead load low.

Overall result in all buildings: wide areas of uninterrupted space —clear ceilings—a pleasing effect—highly functional. Ceco Engineering Service detailed placing plans for Ceco-Meyer Steelforms and reinforcing bars. This was a big project—5,000 tons of Ceco reinforcing steel delivered by truck to the job site—1,000,000 square feet of steelforms placed and removed by Ceco—a job requiring the service of a company skilled in its field and geared to deliver as the need dictated.

Here is another example of Ceco performing on the architect-owner-contractor-supplier team. On your next project call Ceco Product Specialists. They will help you save through product engineering. Consult Sweet's File for address. CECO

Two-way waffle design using Ceco-Meyer Steelforms permits longer spans, resulting in larger uninterrupted floor areas.

One-way Ceco-Meyer Steelforms also save steel and concrete, thus reducing dead load.

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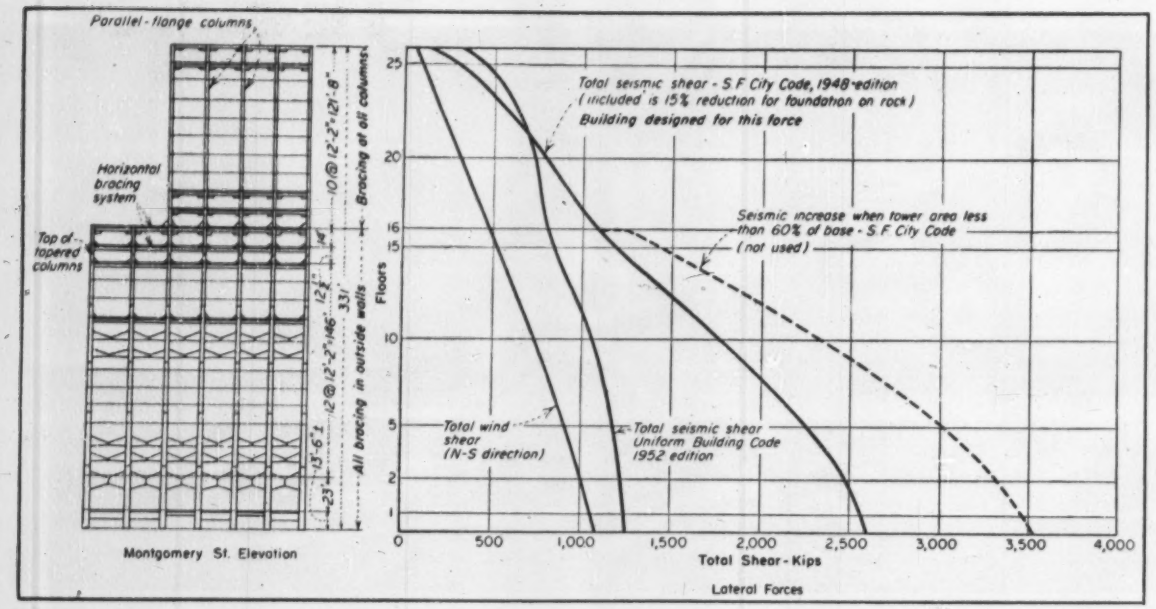

Parallel-flange columns
Horizontal bracing system
Top of tapered columns
Bracing of all columns
All bracing in outside walls
Montgomery St. Elevation
Total seismic shear - S.F. City Code, 1948 edition
(included is 15% reduction for foundation on rock)
Building designed for this force
Seismic increase when tower area less than 60% of base - S.F. City Code
(not used)
Total wind shear (N-S direction)
Total seismic shear Uniform Building Code 1952 edition
Floors
Total Shear - Kips
Lateral Forces

STEEL FRAME for a 25-story building in San Francisco was designed for seismic shears over twice those due to wind.

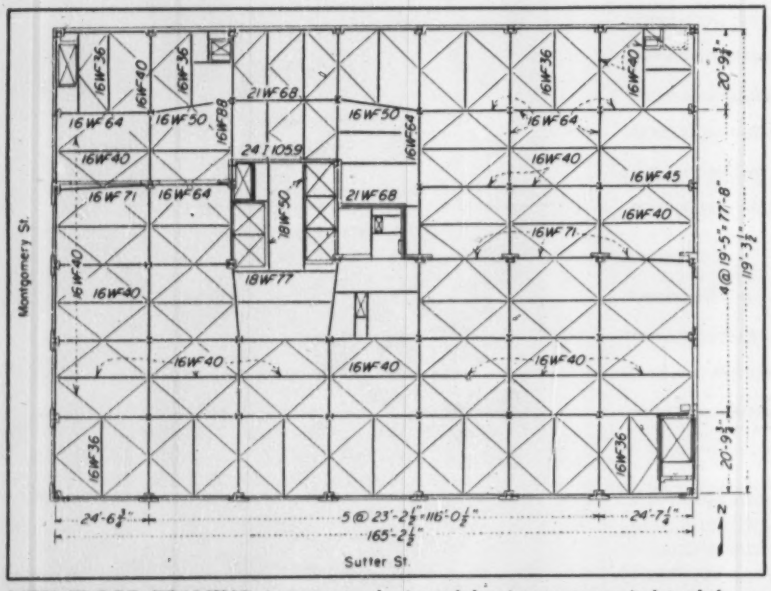
Unique framing for earthquake resistance

Two bracing systems—one employing tapered columns and "butterfly" spandrel beams—enable a skyscraper to meet rigid requirements of San Francisco building code

The steel frame of a 25-story office building being erected for the Equitable Life Assurance Society of the United States in San Francisco will be unusual for several reasons:

(1) Method of bracing to resist seismic forces; (2) use of tapered columns; (3) spandrel beams that look like butterflies because they are considerably deeper at the ends than at the middle; and (4) the use of bolts, rivets and welds as connection devices.

Also, the $12.5-million skyscraper will be the first tall building in the city with steel pile foundations resting on bed rock. More than 400 H-piles, with an average length of 130 ft, are used. These were driven with the heaviest hammer ever built (ENR May 6, p. 36).



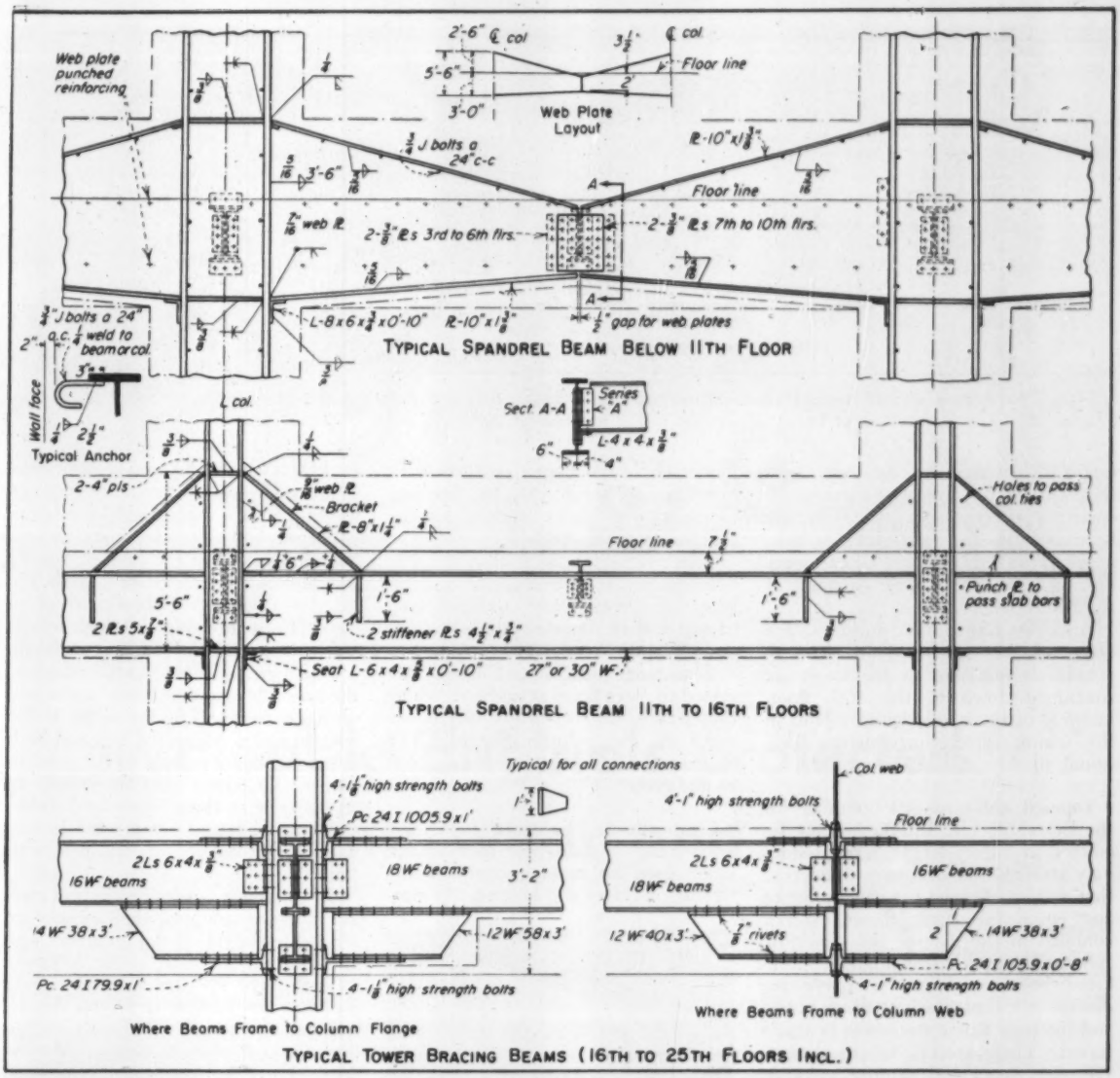
16TH FLOOR FRAMING incorporates horizontal bracing to transmit lateral forces from tower columns to exterior columns of the base section (15th floor similar).

• **Offset**—The Equitable Life Building, with about 450,000 sq ft of floor area, is being constructed in the heart of the San Francisco financial district. The 15-story base will be 122x168-ft in plan; the offset 10-story tower section will be 80x168 ft. In the building exterior, extensive use will be made of stainless steel, in combination with aluminum and white marble.

This will be the first tall office building to meet the rigid requirements for earthquake-resistance design of the 1948 San Francisco building code. As indicated by the chart above, shears near the bottom of the structure due to seismic forces are more than double those due to wind.

• **Why tower and base differ**—To resist large lateral forces, two bracing systems are incorporated in the structural steel frame, one type in the tower and the other in the base. This design resulted from limitations on depth of floor construction.

Typical story height is 12 ft 2 in. With clear headroom of 9 ft under a suspended ceiling, and allowing 12 in. for a duct space, at least 3 in. for a floor slab and a minimum of 2½ in. for beam fireproofing, the structural engineers noted only 18 in. was left for floorbeams. This depth, they found, was insufficient for members



SPANDREL BEAMS are of three types—butterfly (top), top-bracketed (center) and bottom-bracketed. The last type is also used for all beam connections to columns in the tower. The butterfly and top-bracketed types are connected to tapered columns.

needed to withstand the large lateral forces on the lower portions of the building. But the designers could obtain sufficient depth at the periphery of the building, and there they placed the bracing for the first 15 stories.

• **Framing in the base**—Concrete floors, it is assumed, will carry the lateral forces to the exterior columns, which were made big enough to take them. Where shears are greatest, these columns are braced by "butterfly" spandrels, which, because of their depth will reduce the unbraced length of the verticals and the bending stresses in these members.

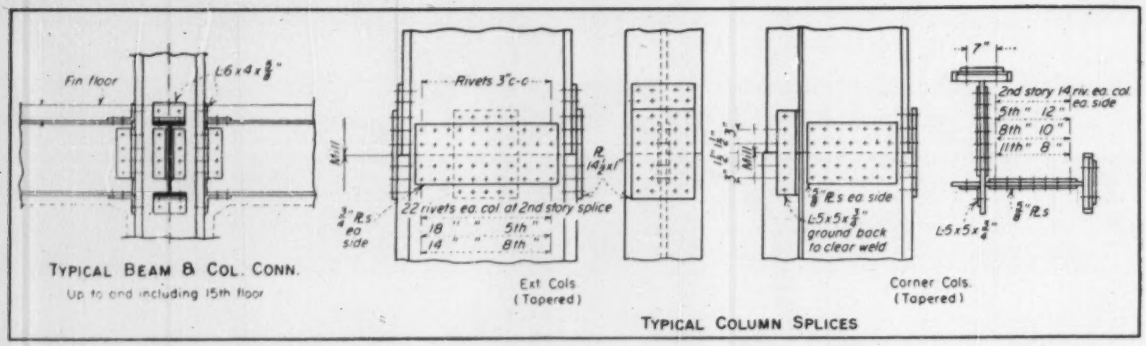
With earthquake resistance concentrated in the exterior for the first 15 stories, interior framing in this portion of the building is accomplished with simple web connections. However, where beams or girders frame to columns, clip angles also are being used on top and bottom flanges for added rigidity. This type of connection will be especially valuable in resisting lateral forces before the floor slab is placed.

• **Tower framing**—For the 10-story tower section, the designers considered it impracticable to use only the exterior columns to take the seismic shears, because of the smaller plan dimensions of the upper stones and the high percentage of floor area occupied by openings for elevators, stairs and ducts. Furthermore, shears in the upper portion are not so great that bracing cannot be incorporated in the available depth. So the designers decided to utilize the entire tower frame.

Columns in the upper stories are turned so that a sufficient number have strong axes in each direction to provide adequate lateral resistance. Connections of beams and girders to these members are designed to transmit bending moment. The horizontal members are deepened at each end with a short length of wide-flange beam, and a T-shape piece of I-beam is attached at top and bottom for the connection with the column. Total depth of beam and bracket is kept constant throughout.

• **Transitional bracing**—Because of the difference in bracing systems in the upper and lower portions of the building, horizontal bracing is needed in the 15th and 16th floors to transmit lateral forces from the interior to the exterior columns. Since the tower is unsym-

(*Continued on page 34*)



SPLICES for heavily stressed tapered columns are made with flange and web plates. L-shaped columns are used at building corners. In typical connections of beams to columns in the lower floors (left), clip angles on beam flanges improve rigidity.

metrically located on its base, two-thirds of the total shear at the bottom of the tower will be carried by the horizontal bracing to the closest side, necessitating insertion of a secondary bracing system of double channels at the 15th floor.

Also, for transitional purposes, the beam brackets employed for beam-to-column connections in the tower are continued down to the 16th floor. Lapping of the two bracing systems in this manner gives the structure additional rigidity at the change-over.

• **Tapered columns**—All columns for the Equitable Life Building are being erected in 3-story lengths. In preliminary studies, the designers discovered that if they followed the usual practice and employed parallel-flange exterior columns in the base of the structure, splices became exceedingly complicated because of the relatively big change in column size at those points and the large flange stresses to be transferred. These studies led to the decision to taper the exterior columns uniformly from base plates to 14th story. With a taper of $\frac{3}{16}$ in. per ft, splices are much simpler than those for parallel-flange verticals.

Exterior columns have a 42-in. web at the bottom, which tapers to a 12-in. web at the 14th story. Flanges are 18x3 in. at the base and 16 in. wide at the top of the tapered section. These members, as well as the tapered spandrels, were fabricated by joining three plates with continuous welds in the fabricating shop.

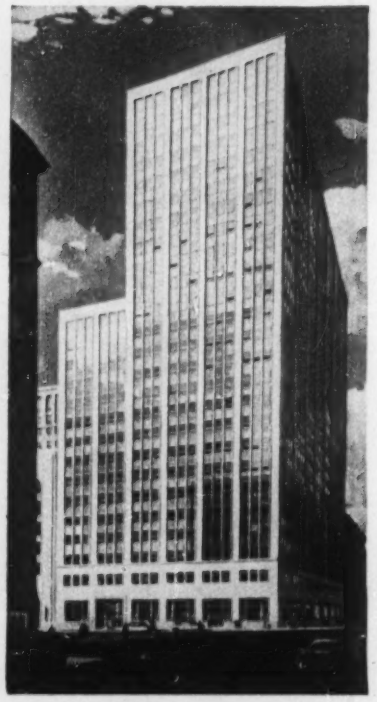
Corner columns in the lower part of the frame are L-shaped members, with heavy flange plates at the extremities of the L. This shape gives the member high resistance to lateral forces from any direction.

• **Spandrel beam design**—Below the 11th floor, where seismic shears are large, all exterior columns are braced by tapered spandrel beams that are much deeper at the ends than at mid-span. The large depth enables these members to resist the big bending moments transferred to them by the columns.

From the 11th floor to the 16th, where moments are smaller, spandrel beams are wide-flange sections connected to the columns by deep brackets on the top flange.

The butterfly spandrel beams are sloped to meet floors at midspan, where they receive support in resisting movement of the column flanges. The beams are 5½ ft deep at columns, 2 ft at midspan.

• **Connections**—The steel design is also noteworthy in that three methods are being used for making connections—riveting, welding and bolting. As mentioned previously, tapered columns and spandrel beams were fabricated by welding plates together in the shop. All other shop connections are riveted. Spandrel beams in the base section of the building are field welded to the exterior columns. Other field beam connections are made with high-tensile bolts, while column splices are riveted.



SKYSCRAPER has tower unsymmetrically placed on the base section.

Before being welded to the columns, the butterfly spandrel beams are seated on angles bent to fit the slope of the bottom flange. Then the web and both flange plates are welded to the column flange. To relieve possible locked up stresses due to these heavy field welds, the tapered beams are erected in two lengths and spliced at midspan with bolts.

In the tower, where beams and girders frame to columns, the brackets are riveted to the horizontal members, and the T-beams are bolted to the columns.

Architects for the Equitable Life Building are Loubet & Glynn Associates and the late W. D. Peugh, of San Francisco, with Irwin Clavan, of New York City, as consulting architect. F. W. Kellberg and Associates are the structural engineers.

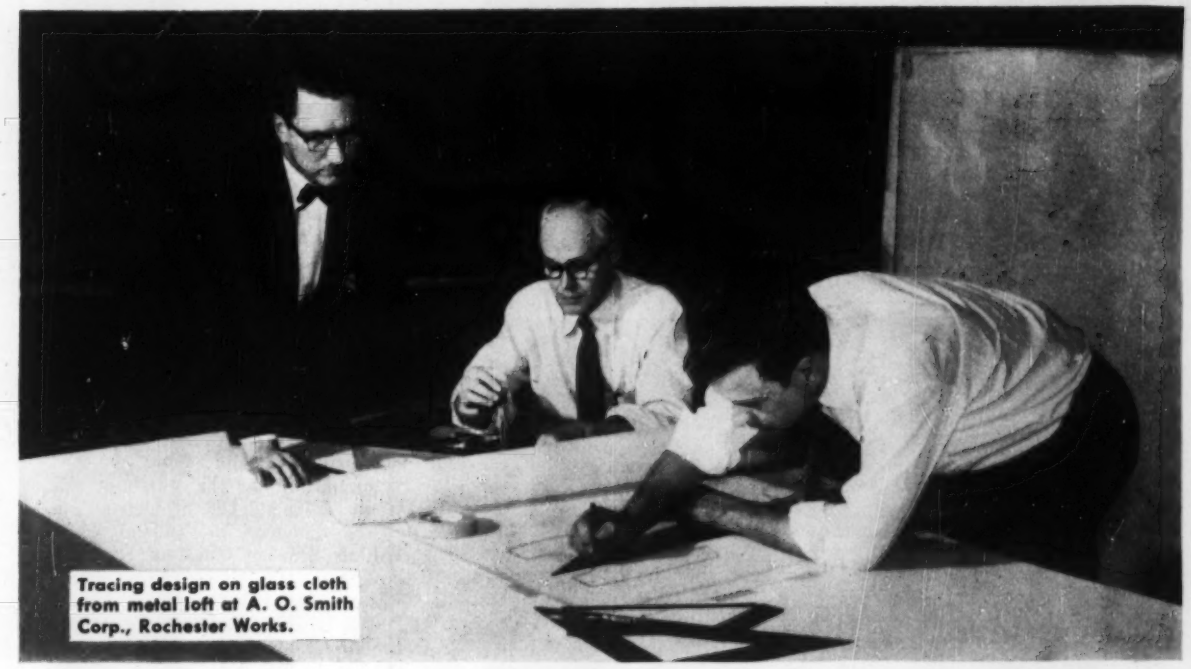
Dinwiddie Construction Co. is the general contractor. Consolidated Western Steel Division of U. S. Steel Corp. is fabricating and erecting the structural steel.

Paper mill waste to be used for road improvement

Plans have been revealed for the use of sulphite liquor, a paper mill waste, in the improvement of some 4,000 mi of Wisconsin secondary roads this summer.

The liquor is used for binding aggregate in dirt and gravel roads, for laying dust and as a soil stabilizer. Combined with oil or tar, it provides a binder and a stabilizer reported to save about $300 a mile in materials and labor.

The 60 million gal of liquor to be used will be shipped in concentrated form from 13 paper mills in the state.



Tracing design on glass cloth from metal loft at A. O. Smith Corp., Rochester Works.

Valuable originals protected against wear and tear

At the A. O. Smith Corp.'s Rochester (N.Y.) Works, large drawings are made exactly to scale on glass cloth. Since these drawings often cost several hundred dollars each, A. O. Smith naturally does not wish to expose them to possible damage during print-making and to the wear and tear of excessive handling. Instead, they use intermediates made on Kodagraph Autopositive Paper.

Costing but a few cents a square foot, Autopositive produces positive photographic prints directly from the original drawings — without a negative step or darkroom handling. It can be exposed in standard print-making equipment and processed in standard photographic solutions. (A. O. Smith uses a vacuum-frame printer, which accommodates drawings up to 8 x 4 feet in size.)

No worries with Autopositive intermediates — they turn out sharp, legible shop prints time after time. Their dense photographic black lines do not smudge or smear. And they can be run at uniform, practical speeds in the company's direct-process machine.

In addition, A. O. Smith keeps an "Autopositive File" showing the history of changes in all their drawings. Before each revision, an Autopositive intermediate is made. Later on, direct-process prints showing the complete story of each design can be made from the intermediates as needed.

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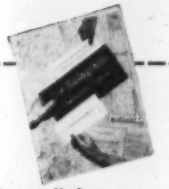

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Midwest beers moving to Pacific Coast . . .

. . . are opposed by established brands as . . .

Brewers invest $100 million in Far West

There's a revolution brewing in the brewing industry on the West Coast. And since this same sort of thing could happen in other industries and other areas, with resulting impact on the construction industry, the case of the West Coast brewing industry is significant.

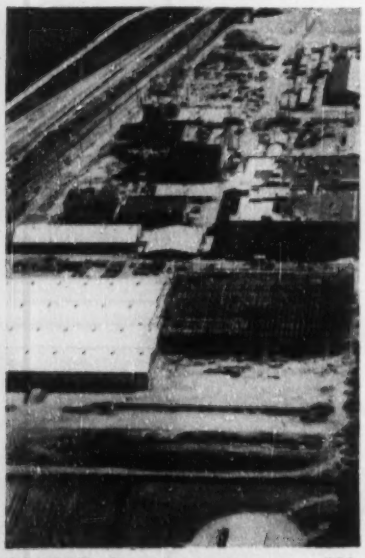
Basic reason for the large brewery construction program (estimated at $100 million) is a rapidly increasing market for consumer products on the West Coast. Well-known Midwestern brewers find that transportation costs drastically reduce the share of the market they can get in competition with established West Coast brewing firms. It costs something like 75¢ a 24-bottle case to ship beer from Milwaukee to Los Angeles. This has historically resulted in a 5¢ a bottle higher charge for "Eastern" beers across the bar as compared with "Western" beers. And the increased costs are passed along in proportion to consumers making their purchase at grocery or packaged goods stores.

Driving home the need for better West Coast distribution is the impact of nation-wide magazine and television advertising. Many authorities predict that such advertising will mean the end of small local breweries. Some, indeed, have already disappeared on the West Coast. But those West Coast brewers who are still in business are determined to stay alive—and this, too, has its effect on construction.

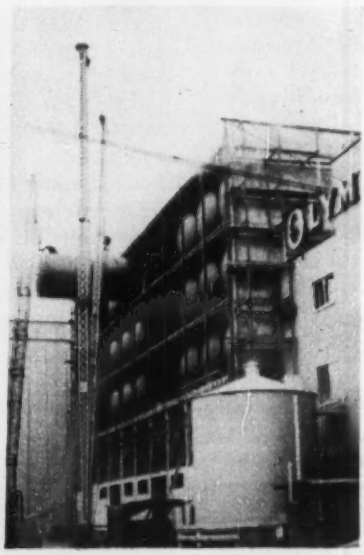
• **Double invasion**—Invasion of the West Coast by Midwestern brewers takes two forms: Local breweries are purchased and rebuilt to handle brewing methods peculiar to the particular brand involved. And—as in two current instances—complete new brewing plants are built.

Specifically on the purchase side, Goebel Brewing Co. of Detroit purchased a brewery in Oakland, Calif.; Falstaff Brewing Corp. of St. Louis bought a 100-year-old firm in San Jose, Calif.; Pabst Brewing Co. of Peoria, Ill., obtained a well-established Los Angeles firm; Theo. Hamm Brewing Co. of St. Paul, Minn., took over a San Francisco brewery; and most recently Liebmann Breweries of New York (makers of Rheingold beer) purchased through a subsidiary a brewery with plants in San Francisco and Los Angeles.

Goebel started distribution from its West Coast plant in 1952, and Falstaff in early 1953. Pabst, after considerable reconstruction, started marketing from its new Los Angeles plant last fall; it also still sells Eastside beer—the "western" brand it purchased. Hamm has nearly completed revamp-



SCHLITZ plant is one of two new $20-million breweries. Steel frame (right) is largest bolted building on West Coast.



OLYMPIA brewery in Washington is being expanded to keep this West Coast beer in the competitive picture.

HAMM'S San Francisco plant involves an extensive modernization of an existing brewery.

ing its San Francisco property and will be marketing soon. Liebmann is reconstructing the Los Angeles brewery it bought, and Rheingold has recently announced a western invasion. Liebmann will continue to market the Acme beer of the San Francisco brewery it bought.

Biggest impact on the West Coast construction industry has resulted from new plants in Los Angeles, built from the ground up by Joseph Schlitz Brewing Co. of Milwaukee and Anheuser-Busch, Inc., of St. Louis. Each plant has a million-barrel-a-year capacity; both are now brewing, and both will soon launch intensive West Coast advertising and promotional campaigns. Features of the Anheuser-Busch plant are described in an accompanying article.

• **Schlitz plant** – The $20-million Schlitz plant is located on a 35-acre plot in the San Fernando Valley area of Los Angeles. Included in the various structures is the largest steel frame building on the West Coast making exclusive use of high-tension bolts for connections.

Another feature of the Schlitz plant was speed of design and construction. Design started in January, 1953, and construction a month later. Trial brews were made about a year later and full-scale distribution will start soon.

Designers of the Schlitz plant are Harley, Ellington and Day of Detroit. Structural engineering is by Brandow & Johnston of Los Angeles. General contractor is the P. J. Walker Co. of Los Angeles.

• **Western brewers fight back**—But the major West Coast brewers aren't taking these invasions without a struggle. Lucky Lager Brewing Co. with plants at Vancouver, Wash., and at San Francisco and Azusa in California, has built and expanded its Azusa plant within the last five years (ENR Apr. 26, 1951, p. 50). And Lucky Lager also has just announced a $1.4-million expansion of the San Francisco plant.

Olympia Brewing Co. of Olympia, Wash., and San Francisco Brewing Corp. are both engaged in large programs expanding their existing facilities. And other West Coast brewers are following suit on a lesser scale. All of them, however, are "mending their fences" by extensive advertising campaigns.

Which ones of the various brewing concerns will get the major share of the West Coast beer dollar remains to be seen. But their efforts have not left western engineers, contractors and materials suppliers the least bit unhappy.

NEW BUDWEISER BREWERY in Los Angeles covers a large area with various types of complicated and up-to-date construction.

Bell caissons, tapered girders feature a West Coast brewery

The new $20-million Anheuser-Busch, Inc., brewery in the San Fernando Valley area of Los Angeles is distinguished by the most extensive use of belled-caisson foundations in southern California. Also of interest is a warehouse building that includes 100-ft tapered girder spans. Design emphasis was on single-story buildings even though essential portions of the multi-structure brewery reach the Los Angeles Building Code height limit of 150 ft.

Modern brewing is a complex, large-scale industrial process. Details of the process design are carefully worked out by the brewer to assure a high quality product. And where a firm has several plants, the process must guarantee a uniform result. As can be imagined, specific process details are a closely guarded secret.

Designing facilities to encompass the process, whatever it may be, is not simple. For example, the new Budweiser plant will have a water demand of 2,000 gpm, a connected power load of 9,000 kva and a steam supply of 120,000 lb per hr. And many acres of floor space are air conditioned to minimum tolerances. Thus, brewery design organizations must include a variety of specialties. For its southern California brewery, Anheuser-Busch retained Holmes & Narver, Inc., of Los Angeles as design engineers and construction supervisors.

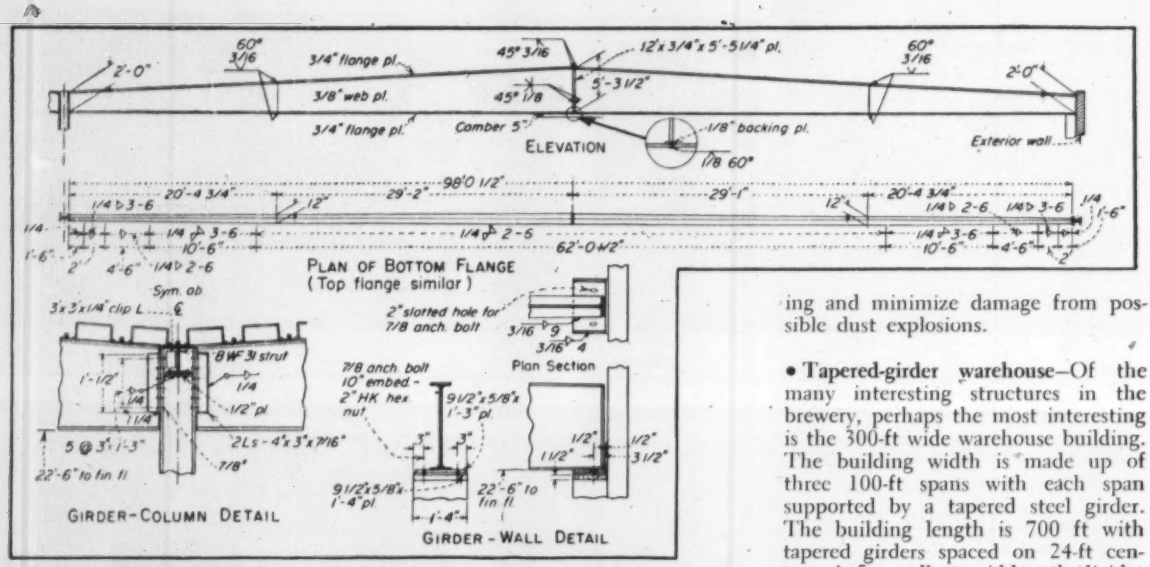
The new Budweiser plant, like most breweries, has a number of special-purpose buildings, each designed for a specific function.

The grain silos and the brew house reach the 150-ft height limit, and both of these buildings are of reinforced concrete. These high buildings impose heavy loads on the underlying soil. But so do the low buildings because of extensive use of tanks and vessels that for design purposes must be assumed to be 100% full of fluid. Thus foundation design is highly important.

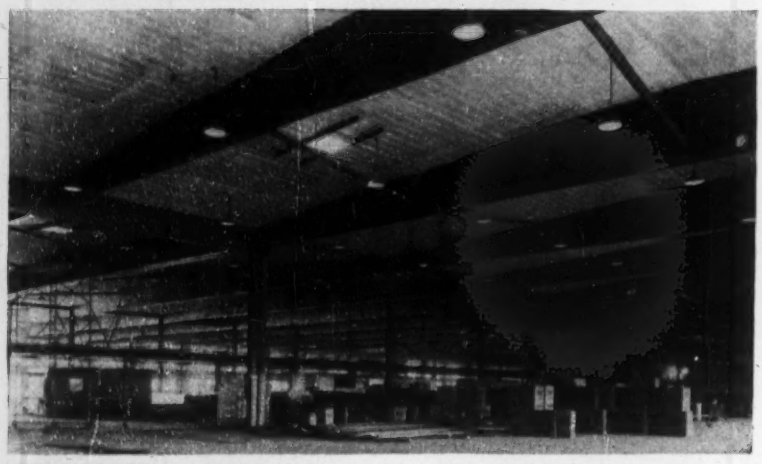
• **Belled-caisson foundations**—Soil surveys made by Dames & Moore, soil mechanics engineers, indicated that under much of the area a relatively firm stratum of compacted gravels lay some 50 ft under the deep valley alluvium.

After careful study, including extensive consideration of driven piles, the design engineers concluded that where the gravel stratum was available, belled caissons would serve best.

(*Continued on page 38*)



TAPERED STEEL GIRDERS are fabricated from steel plate and include tapered flanges. Column connections are carefully detailed for welding.



THE GIRDERS span 100-ft wide bays in the warehouse and bottling plant portion of the brewery. Horizontal forces are transmitted by the steel roof deck acting as a diaphragm to exterior gunited walls serving as shear walls.

This, fortunately, was under the heaviest of the buildings. At other places, 40-ft long drilled friction piles were deemed adequate.

On the entire job there are some 2,000 belled caissons and drilled friction piles from 1½ to 3 ft dia—the caissons flaring at the bottom to as much as 8¼ ft dia. The caissons were constructed by drilling holes 60 ft deep, inserting reinforcing cages, and filling with concrete. Each caisson was completed before one adjacent to it was drilled.

Substantial parts of the seismic loads transmitted to the foundations are resisted by deep foundation beams working with the relatively slender caissons.

For example, included in the grain silo building are grain bins, 52 ft square in plan, and some process vessels that result in concentrated loads. Total building height is 156 ft. Caissons under the silo building are on 8-ft centers. These are topped by 7-ft deep reinforced concrete beams below grade level forming an open grillage pattern. Thus, horizontal seismic forces transmitted to the foundations to a large extent will be resisted by earth pressure against the concrete beams.

The grain bins are covered with lightweight concrete panels. These are not attached to the main structure, so they will blow out in case of an explosion in the bin—thus protecting the bin. At other places where dry grain is processed, great use is made of windows—the walls are almost 100% glass—to provide adequate venting and minimize damage from possible dust explosions.

• **Tapered-girder warehouse**—Of the many interesting structures in the brewery, perhaps the most interesting is the 300-ft wide warehouse building. The building width is made up of three 100-ft spans with each span supported by a tapered steel girder. The building length is 700 ft with tapered girders spaced on 24-ft centers. A fire wall at mid-length divides the structure into two parts.

The girders are welded from plates, the web members being ⅜ in. thick and the flanges ¾ in. thick. Depth is either 2 ft or 2¾ ft at the ends and 5 ft 3½ in. at midspan. Flanges are tapered from a 6-in. width at the ends to a uniform 12-in. width some 20 ft from the ends (see drawing).

The warehouse roof is a steel deck, flat on the underside and with 6-in. deep cells on the upper side. Walls are free-standing gunited slabs.

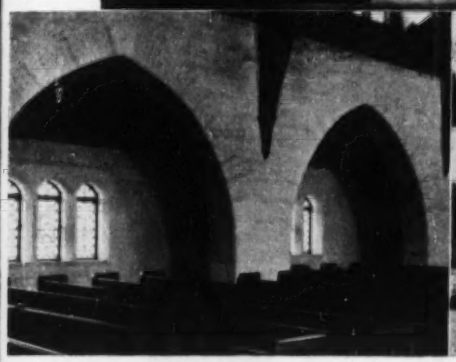
Lateral forces, seismic and wind, are resisted by the steel. roof deck serving as a horizontal diaphragm and transmitting the load to the gunited walls that act as shear walls. There is no horizontal bracing other than the roof deck. The roof diaphragm was given special study by the Los Angeles building department. It is believed to be the largest such diaphragm ever constructed.

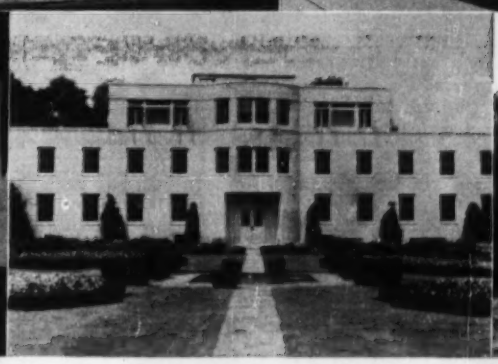
The stock house, which includes 45-ft long glass-lined aging tanks, is only one story high, an innovation in brewery practice. Purpose is to reduce loads on foundations, permit use of reinforced concrete (steel was not readily available when design was started) and to simplify the structure. Sufficient area was available at the site for such a building. It is so laid out that travel-through time is no greater than for a multi-story building.

Other design features include concrete tanks, 9x16x45 ft, in batteries three stories high that were prestressed longitudinally to minimize shrinkage cracks and thus reduce or eliminate leakage. Prestressing of these tanks was accomplished by the Freyssinet method using cables of ten wires, each 0.239-in. dia. Details of

(*Continued on page 40*)

Build Better with VIBRAPAC Block





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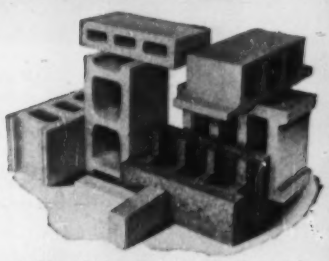
A half century of scientific progress in quality control has won universal respect for VIBRAPAC Block. The functional qualities of these Modern Masonry Units, plus their wide range of practical adaptability, have inspired the most advanced creative construction. Many years of research have paved the way for lightweight aggregate and perfected VIBRAPAC manufacturing processes. As a result, structural loads are reduced without sacrificing rugged, constructional security. Firesafety — stormsafety — insulation against heat and cold — acoustical and soundproofing qualities — low initial cost — low upkeep. All these are added advantages. Yes, you'll be proud of the modern masonry miracles you can perform with VIBRAPAC Block.



A few of the many standard modular building units engineeringly sound, architecturally beautiful, for top quality construction at low cost.

BESSER VIBRAPAC — the fully automatic concrete block machine. Produces high quality masonry units, of any desired texture and density, at the lowest possible cost.

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Ask for FREE copy of bulletin illustrating the complete line of standard modular building units available and giving technical guidance in their many structural uses. Contact your local VIBRAPAC Block Plant or write direct to the Besser Manufacturing Company, Box 181, Alpena, Michigan, U. S. A.

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Galvanized Sheets

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Engineers and designers of industrial and commercial buildings know galvanized sheets to be superior building material for this type of construction—particularly for roofing and siding. They know that time-tested galvanized sheets offer:

- **SHORT-TERM *plus* LONG-TERM ECONOMY**
  Low *initial* cost, low *application* cost, low *per-year* cost
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  Withstand rough treatment, add structural strength and are fireproof

All galvanized sheets give years of useful service. But the *heavier* the zinc coating, the *longer* the life of the base sheet. Because various weights of zinc coating look alike on the surface, it pays to *specify a grade-marked sheet* . . . Get the heaviest coating you can buy!

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IT'S THE ZINC THAT STOPS THE RUST

For long, rust-free service, specify a heavy duty sheet such as the "Seal of Quality" with a zinc coating of 2 *ounces per square foot.* For heavier coatings order according to ASTM Specification A 93.

ATTENTION: MAINTENANCE DEPTS.

Get the facts on MZP (Metallic Zinc Paint) for structural steel and galvanized surfaces. Also, zinc for cathodic protection and grounding electrodes. Check coupon below.

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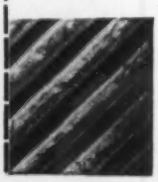


these tanks were developed by the Bosari Tank Corp.

• **Water important**—One of the most important considerations governing location of the new plant was water supply. In the brewing process a good quality of water is highly desirable. But, it is even more important that the water delivered to the plant be of uniform quality.

In Los Angeles there are three sources of water: The Los Angeles Aqueduct that brings water from the Sierra Nevada, the Colorado River Aqueduct that brings water of a high mineral content from the Colorado River and local supplies from wells and rainfall run-off. By locating the plant far enough north in the San Fernando Valley, there is assurance that only Los Angeles Aqueduct water will be supplied. And this promises the greatest probability of uniformity.

Other considerations in location are size of tract, power supply and rail and highway connections. The San Fernando Valley was indicated for all these reasons. Service provided by the Southern Pacific is more than adequate for the ten spur tracks emerging from the plant. And the Los Angeles Department of Water & Power is building a new steam power plant that promises reliability in power supply. Even so, two power leads are brought to the plant, each from a different power source.

The brewery being constructed for Anheuser-Busch, Inc., will provide nearly 1,000,000 bbl a year brewing capacity for Budweiser beer. It is capable of being expanded to nearly double that capacity.

Construction is being carried out by a joint venture of C. L. Peck of Los Angeles and Cahill Brothers, Inc., of San Francisco.

Roadbuilding at sea?

Dryland salvage of sunken ships sounds a bit incongruous, but it is being considered.

When a ship is sunk close to shore, perhaps the best way to reach it in order to salvage its cargo is to build a road to it.

That is the thought of E. A. Canipe, of Havelock, N. C., head of the Canipe Salvage Co., who is seeking to salvage the cargo from the freighter Omar Babun, aground on North Carolina's outer banks.

Canipe plans to bulldoze a road through the shallow sea, surface it with airport runway matting and then drive trucks out to the ship to salvage its cargo of machinery.

For the most part the water through which the road would run is only two or three feet deep.

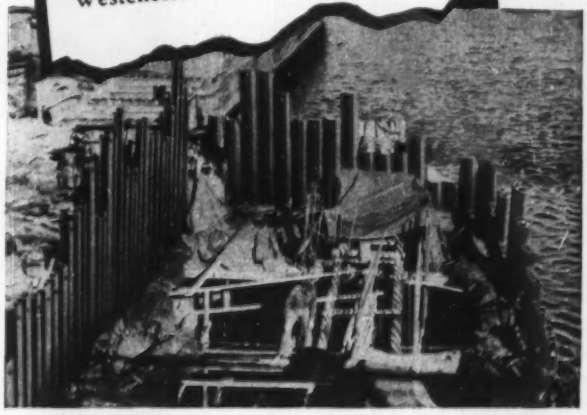
"The BIG SAVING was FOSTER RENTAL PILING"

On complicated 3-sided cofferdam for the $5 million East Bronx Unionport Bridge Construction.

Says John Ury, Project Manager for Contractors:

WM. M. MOORE BUILDING CORP.
and
LOPIER CONSTRUCTION CORP.
75 West 190th Street
Bronx, New York

Construction started in 1949, and skillful driving of 30 to 45 ft. Interlocking Steel Sheet Piling by these 2 contractors made this an economical, successful job. Unionport Bridge crosses Westchester Creek in East Bronx.



Rental Piling had to be driven considerably below the bed of the creek, with extra reinforcing to protect against swells.

An interesting installation of piers had to be constructed atop 35-year old existing caissons. Here was a tough water seepage problem in a complicated 3-sided cofferdam — approximately 1,000 gpm had to be pumped out of the cofferdam by two 6-inch pumps. Steel Sheet piling was needed — on time — in the exact section and lengths (30 to 45 feet). And Foster had it — just what the job required. A phoned order — a prompt delivery, a dependable quality — and a low cost, requiring no huge purchase investment on the part of the contractor, made FOSTER RENTAL PILING the 100% answer for this job.

Let us quote you on our low-cost Piling Rentals —prompt service from 5 Foster warehouses. Free Piling Catalog illustrating diagrams of all standard makes of piling sections is available.

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RAILS—TRACK EQUIPMENT • PIPE • WIRE ROPE

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When you blast in an area like this...

Roadway near gas storage tanks.

Parking lot below roadway.

Adjacent residential area.

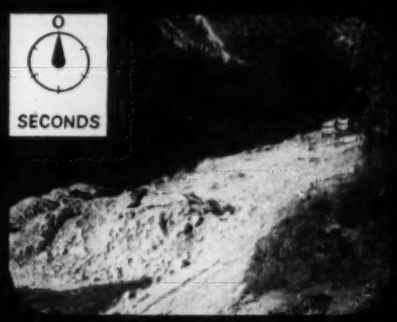
Instrument factory opposite blast area.

ABOVE are some of the blasting problems that faced the Central Pennsylvania Quarry, Stripping and Construction Company on By-pass Route 22 through Easton, Pa. The highway passes gasoline storage tanks, business establishments, homes, a cemetery, a precision instrument factory and a parking lot full of cars. As a result, maximum control was imperative. Flying rock had to be minimized, yet good displacement was needed for easy digging.

The results of the ROCKMASTER blasting system on this job speak for themselves. The contractor obtained efficient use of force, controlled throw and maximum breakage. Noise, flying rock and vibration were kept to a minimum. The broken rock was blasted *toward* the slope and not scattered into the valley below.

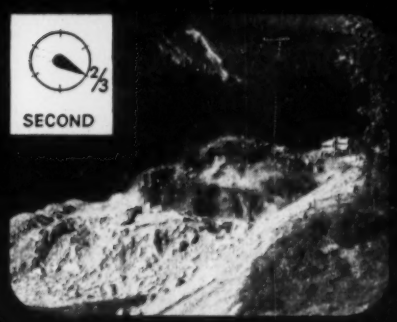
When you have shooting problems like this, ROCKMASTER can help you, too. Literature is available.

Rockmaster® can help you like this...



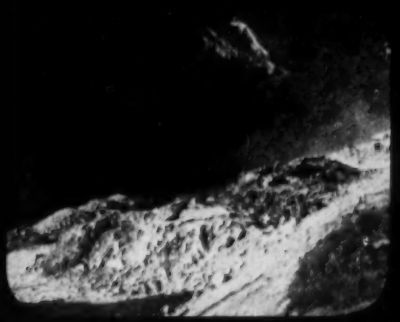
1. One section of the roadway . . . 100 holes loaded and ready to shoot.

2. Burden receiving full power of the explosives. Flying rocks eliminated.



3. Peak of blast. Confinement excellent. Burden moving up slope.

4. Full second after detonation. Gases appear but air blast avoided.



5. Final pile shows good displacement. See how it has "climbed" slope.

This is the pattern of the blast. It was loaded in five rows of twenty holes each, arranged to fire in ROCKMASTER *periods shown at left.*

1 & 2—Row 1
2 & 3—Row 2
3 & 4—Row 3
4 & 5—Row 4
6—Row 5

ATLAS

ATLAS EXPLOSIVES

"Everything for Blasting"

ATLAS POWDER COMPANY • WILMINGTON 99, DELAWARE

Offices in principal cities

WHICH HYDRANT HAS THE REPLACEABLE BARREL?
MATHEWS
Yes, sir! The barrel containing all working parts fits into the protection case. All you do is put in a new barrel when it's broken in a traffic accident.

MATHEWS Means Fire Protection

LONG LIFE. Mathews Hydrants are protected at wear points by bronze bushings — corrosion and rust are thoroughly licked.

TROUBLE-FREE. The stuffing box plate, cast integral with the nozzle section, provides a positively leak-proof construction — water, sediment and ice cannot interfere with operating thread.

LOW-COST MAINTENANCE. Only one point requires lubrication — and that only during routine inspections.

REPLACEABILITY. A Mathews leveled in an accident can be replaced without excavating and in a jiffy. Community fire protection is interrupted only for a few minutes.

The Mathews includes every quality feature . . .

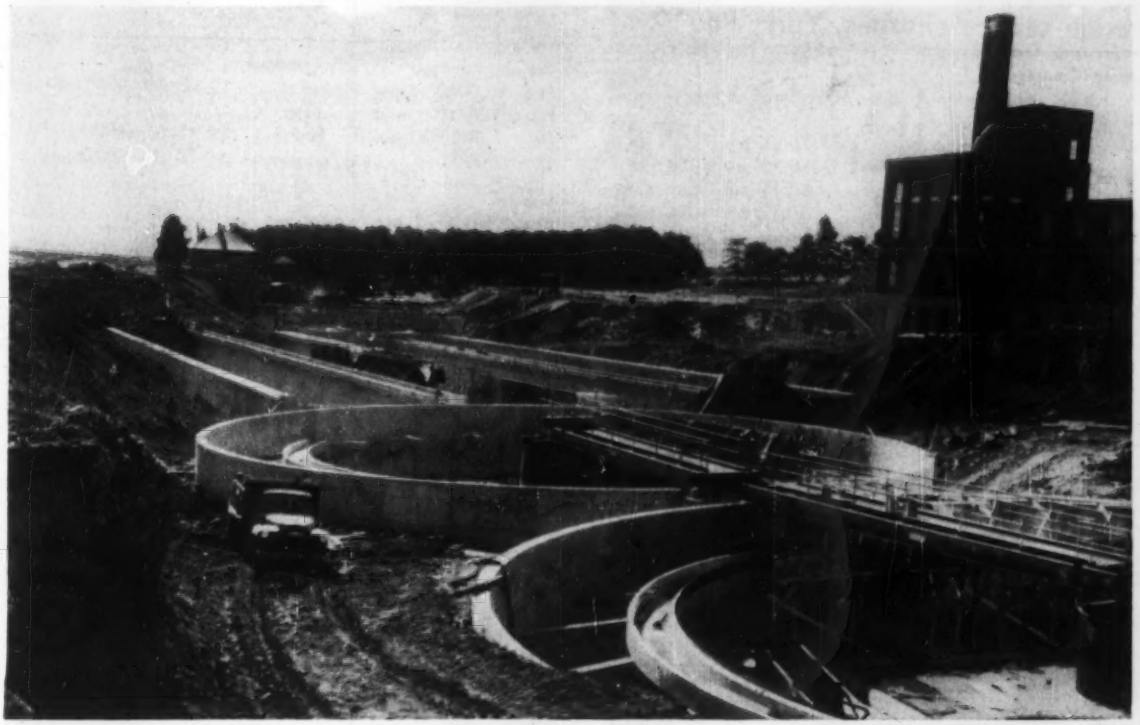
Compression type valve to prevent flooding • Head turns 360° simply by loosening bolts • Replaceable head • Nozzle sections easily changed • Protection case of "Sand-Spun" cast iron for strength, toughness, elasticity • A modern barrel makes an old Mathews good as new • Mechanical-joint pipe connections as needed

MATHEWS HYDRANTS

Made by R. D. Wood Company

Public Ledger Building, Independence Square, Philadelphia 5, Pa.

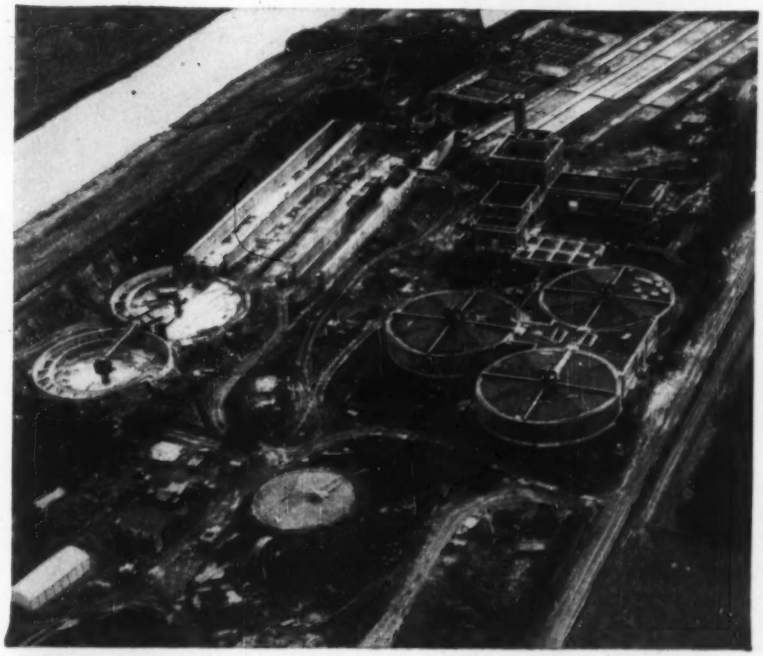
Manufacturers of "Sand-Spun" Pipe (centrifugally cast in sand molds) and R. D. Wood Gate Valves



TREATMENT BASIN DESIGN called for excavation in rock to achieve flow through plant without pumping.

'54 model: on sound financial foundation

York, Pa., sewage works has most all the latest features including Pennsylvania's successful authority—revenue financing



COMPLETE TREATMENT by activated sludge is outlined in this airview taken during construction last winter. Drying beds of existing plant (upper right) will be abandoned; rest of old works is converted for use.

The sewer authority building a $4-million, 12-mgd activated sludge treatment works for York, Pa., is converting and extending an old Imhoff tank plant into a 1954 model. It is doing this on a sound revenue financing plan.

Sewage in the new plant will pass existing screens and have primary settling in what were York's sedimentation and Imhoff tanks, then it will flow by gravity through aeration and secondary settling tanks set below natural grade.

Although the flow line goes well below grade of the river bank, it does not go below normal elevation of Codorus River. Thus the plant will avoid continuous pumping; effluent will be pumped into the river only during flood flows—11% of the time.

Aside from the construction below grade of its secondary treatment units, this complete treatment plant has many other interesting features: It embodies much of what is new. Also, it is an example of Pennsylvania's successful authority financing of sewerage for rental-purchase by a city.

• **Authority financing** – York City Sewer Authority was incorporated un-

(*Continued on page 46*)

Sewage service charges, York, Pa.

Metered Commercial

Based on approximately 75% of metered water revenue, billed at:

First 15,000 gal per quarter . . . . . $0.38 per 1000 gal
Next 185,000 gal per quarter . . . . $0.25 per 1000 gal
Next 1,800,000 gal per quarter . . . $0.15 per 1000 gal
Over 2,000,000 gal per quarter . . . $0.12 per 1000 gal

Industrial Flat Rate and Metered

Based on $0.65 per quarter per employe with minimum of $6.50 per quarter and excess water over 2000 gal/quarter per employe billed at:

First 200,000 gal per quarter . . . . . $0.25 per 1000 gal
Next 1,800,000 gal per quarter . . . $0.15 per 1000 gal
Over 2,000,000 gal per quarter . . . $0.12 per 1000 gal

Metered Commercial

Based on approximately 0.83% of metered water revenue to include conveyancing and financing, billed at:

First 15,000 gal per quarter . . . . . $0.42 per 1000 gal
Next 185,000 gal per quarter . . . . $0.28 per 1000 gal
Next 1,800,000 gal per quarter . . . $0.17 per 1000 gal
Over 2,000,000 gal per quarter . . . $0.13 per 1000 gal

Industrial

Based on $0.72 per quarter per employe with minimum of $7.20 per quarter and excess water over 2000 gallons per quarter per employe billed at:

First 200,000 gal per quarter . . . . . $0.28 per 1000 gal
Next 1,800,000 gal per quarter . . . $0.17 per 1000 gal
Over 2,000,000 gal per quarter . . . $0.13 per 1000 gal

Industries discharging industrial wastes shall pay, in addition to the above, a quarterly charge based upon volume and concentration of waste.

As recommended by the consulting engineers, a discount of 6% will be made for prompt payment of all bills.

BASIS OF FINANCING—York, Pa., is a financially sound town—it has balanced industry surrounded by rich farmland.

der state law in November, 1950. On March 1, 1950, the authority took title to all existing facilities and entered into a 31-year lease with the city of York. The 30-year bond interest rate averaged 1.832%. The city has been paying fixed rental payments each year, and just last March 1 began collecting sewage service charges under a new ordinance.

Consultants Albright & Friel, Inc., of Philadelphia, wrote the report on which the $4.7-million revenue bond issue was based. (They also designed the plant and have been supervising construction.) Based on their estimates of costs and operating expenses, the consultants worked out a system of charges to bring in necessary revenue, plus a 26.84% cushion each year. Recommended charges are being collected, based approximately on 75% of total water revenue or 90% of water revenues from fixtures chargeable for sewer rental.

Bases of charges for the different types of services are listed in the accompanying box. One of the notes at the bottom of that box of quarterly charges indicates that industrial wastes are being charged for additionally, depending upon volume and concentration. Here's how that works:

Additional charges will be determined by the formula written as—

$$AC = F(BOD - 200CF_{BOD}) + F(S - 800CF_s) + F(CD - 20CF_{CD})$$

where AC is the additional charge; F is flow in cu ft per quarter x 62.5; BOD is biochemical oxygen demand in ppm; S is total solids in ppm; CD is chlorine demand in ppm; CF_{BOD} is a cost factor per lb of BOD; CF_s is a cost factor per lb of total solids; CF_{CD} is a cost factor per lb of chlorine.

Cost factor will be developed on the three loading components of the plant and will include proportional cost of debt service charges applying to each component, plus operation cost applying to each component.

• **Propeller pumps**—Pumps for discharging plant effluent, during the 11% of the time when pumping will be necessary, are electronically controlled propeller type units. Each of two will be capable of pushing out 30 mgd against a head varying 5 to 25 ft.

• **Sludge conditioning**—Handling and conditioning facilities will take York plant sludge all the way to bags for sale as a soil conditioner. Sludge is to be collected, pumped and conditioned in a tank 15 ft deep, 20 ft in

Design criteria

York, Pa., Sewage Treatment Plant

Design population: 90,000 (1970)

Design flows: average—12 mgd
maximum—18 mgd
storm—26 mgd primary only (secondary by passed over 18 mgd) per capita —133 gal/day

Loadings: BOD—212 ppm
Susp. solids—460 ppm
Industrial wastes — 78,000 pop. equivalents from over 400 industrial and 1,100 commercial connections

CONTROL BUILDING houses filters, dryer, incinerator, power plant, blowers, laboratory—and controls.

diameter, with a stirring mechanism. Three units, each capable of 1,000,000 Btu per hour, using cooling water from the power plant's gas engines, will preheat the sludge. In addition, there will be two oil-sewage gas-fired 1,200,000 Btu boilers, which will cut in automatically if the heat requirements in the digester are not satisfied. Preheated sludge will go to three 90-ft dia fixed-cover digesters, each 30 ft deep, to be loaded to 35,400 lb of dry solids daily (6.4 cu ft per capita is their capacity). A separate 150,000-cu ft gas tank will float on the gas distribution line at a pressure of 10 in. of water.

Digested sludge will be eleutriated in twin tanks laid out for two-stage or parallel operation. These will afford 420 gpm of eleutriation water and 210 gpm of sludge for a 2:1 ratio with a 2½-hr detention period.

• **And disposal**—Vacuum filters will be of spring coil type; two 10x10-ft units will provide 1,570 sq ft, enough for 32,000 lb of dry solids per day. Facilities for storing and mixing ferric chloride as sludge conditioner are included.

Flash drying and incineration will complete disposal of sludge, but any or all of the dried product can be bagged for sale if a market develops. (York is in one of eastern Pennsylvania's most prosperous farming areas.) Incinerated sludge ash will be disposed of hydraulically to a lagoon.

• **Power plant**—Air blowers for the activated sludge process include two 3,500-cfm units which will be gas-engine driven; one 3,500 cfm unit electric-motor driven. There will be a sludge gas-gasoline engine to drive a generator for auxiliary power to be used in case of power failure.

Other features of the plant are up-to-date but not unusual. Plant effluent will be chlorinated, as is usual.

• **Design, finance, construction**—For Albright & Friel, of which Francis S. Friel is president, A. A. Estrada was in charge of design of the York plant and formulated its financing. George E. Fieldhouse has been supervisor of construction operations, with James Lynham the project engineer at the job.

Sparkplug of the York City Sewer Authority is its civic-minded secretary, Samuel W. Harbold.

Major construction contracts have been held by: McElwee-Courbis & Ertel Construction Co. of Camden, N. J. (a joint venture), $3.7 million for structural and mechanical work; Cates & Shepard, Philadelphia, $216,000 for electrical work; Humble Mundis, Inc., York, heating; and Corbits Inc. of Reading, Pa., plumbing.

ANOTHER PROBLEM SOLVED BY SPENCER, WHITE & PRENTIS

Automatic jacks shove building in 5 ft. strokes
Girdle of steel reinforces bearing walls
Building rolls on these ball bearings—300 per ft.

Project: Moving monastery for Oblate Fathers, at Cap-de-la-Madeleine, Quebec, Can.

Consulting engineers: Surveyer, Nenniger & Chenevert, of Montreal.

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With customary roller method, there is a tendency of the rollers to skew, causing a building to move sideways. Such possibilities were precluded by this new technique. Incidentally, it is believed to be the first time that ball-bearings have been used to move a building.

Literature on moving structures — together with catalogue — will be sent on request.

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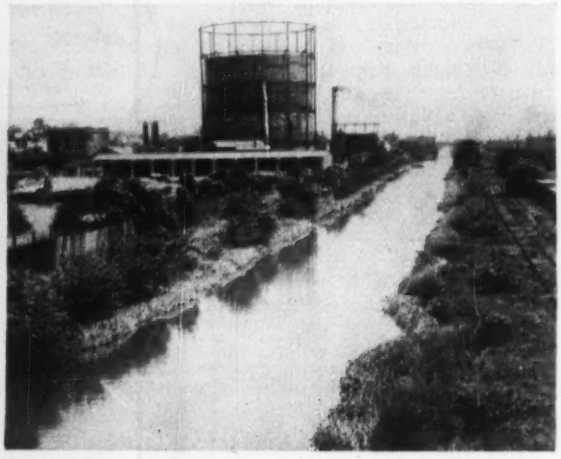


ALONG THE OLD DELAWARE AND RARITAN CANAL before the fluming of the section shown at right and drainage of the portion shown at left. The Trenton Freeway follows the bed of this waterway for a large part of its length.

Old canal beds solve tricky by-pass problem

For years, motorists in Trenton, N. J., blamed the historic Delaware River and a network of canals and creeks for the almost intolerable traffic jams which choked the downtown business district of the New Jersey capital.

Squeezed against the east bank of the Delaware River, bisected by the Assunpink Creek and the Delaware & Raritan Canal, and further cut up by the Canal Feeder and the old Water Power Canal, Trenton's mid-city street pattern was a hodgepodge of narrow streets that started on the banks of one stream, ran a few blocks and then stopped dead against the banks of another.

To show how bad things were, Trenton had only one thoroughfare—State Street—that ran all the way through the business district from east to west, and only two streets—Warren Street and Broad Street—which ran all the way through from north to south.

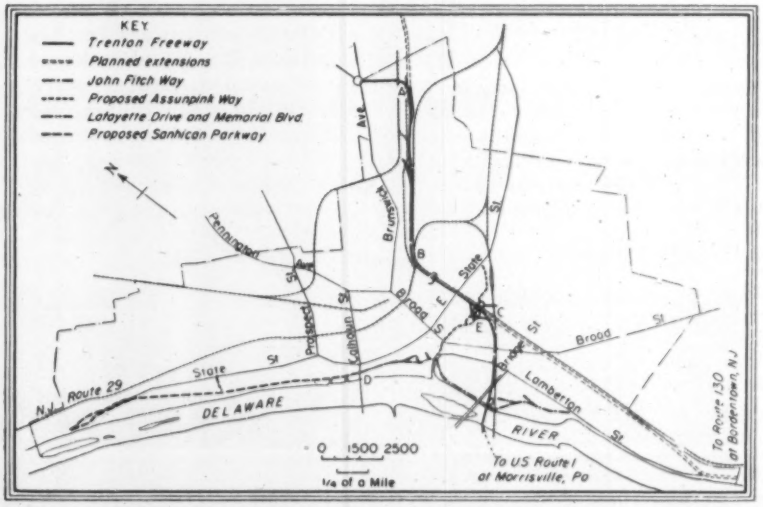
During the last five years, however, city planners have been making use of these waterways to provide Trenton with a network of high-speed freeways and limited access roads that can whisk motorists in and out of the shopping district.

• **Six-point program**—The road-building program has been divided into six steps to be carried out jointly by the city and the state. Three of the steps have been completed; three more are yet to be taken.

The first step was a joint venture to build Lafayette Boulevard through Stacy Park, in the rear of the State House. This six-lane, dual highway, which cost $350,000, actually extended Lafayette Street westward from South Warren Street to Calhoun Street and, with a spur road called Memorial Drive, provided access to the city's War Memorial Auditorium and the parking lots in the rear of the State House.

Next, the city constructed John Fitch Way, a six-lane limited-access road along the river bank, under the bridges that carry U. S. Route 1 and the Pennsylvania Railroad over the Delaware, and connected Lafayette Boulevard with Lamberton Street, Lalor Street and South Broad Street. This road cost the city $200,000, but City Engineer Joseph E. English explained that the city had no problem with cross streets, no expensive overpasses or underpasses to construct, no complicated traffic intersections.

The big project in the six-pronged highway construction program, however, was the $15-million Trenton Freeway which was built by the State Highway Department and the $7,100,000 toll bridge across the Delaware built by the Delaware River Joint



PASSAGE THROUGH—OR ACCESS TO MIDTOWN TRENTON is accomplished from any direction by means of a network of highways built in water rights of way.

WATERWAYS BECOME HIGHWAYS as sections corresponding to those shown on the opposite page are altered for vehicular traffic. Most of the other canals affected in the program were used originally as sources of water for power.

Toll Bridge Commission. This Freeway carries the heavy traffic of U. S. Route 1 right through the heart of the city without a cross street or a traffic light and dumps it back on Route 1 one mile west of Morrisville, Pa., on the west bank of the Delaware.

For most of the route through Trenton, the Freeway follows the bed of the Delaware & Raritan Canal, long ago abandoned. In fact, a large portion of the canal bed had been filled in during the 30's. But the state still owned the right-of-way and nothing had ever been built on it. State highway engineers say the cost of such a road would have been prohibitive were it not for the fact the right-of-way was already owned, leaving only small parcels of land to be purchased for access roads.

• **Freeway job**—Building the Freeway, however, was more than just laying a concrete roadway on top of the filled-in canal bed. From the foot of Strawberry Street (Point A on map) to the foot of Rose Street (Point B) the canal had to be flumed because several industrial firms had perpetual water rights and because the State Division of Water Policy & Supply insisted that the canal was a potential source of potable water. This flume alone cost more than $2.5 million.

From the foot of Rose Street (Point B) to the foot of Lewis Street (Point C) the canal already had been filled in, but a great deal of this had to be excavated so that the Freeway could underpass important cross arteries such as Perry and State streets.

The state highway department's work ended at the foot of Lewis Street. Thence the eight-lane divided highway was continued through a blighted residential district—underpassing or overpassing the main through streets—as the approach to a new toll bridge across the Delaware River. As such, it was built by the Delaware River Joint Toll Bridge Commission and is being paid for out of tolls collected.

On the Morrisville side of the Delaware, a ¾-mile spur was constructed by the Pennsylvania Highway Department to connect the toll bridge with U. S. Route 1 at Snipes Corner.

Work on the Freeway was started April 7, 1948, and the Freeway and toll bridge approaches were opened in their entirety in September, 1953.

• **In the works**—Although these projects have helped to relieve traffic congestion to some extent, the highway planners say the full effects will not be felt until the three remaining steps are completed. These are:

1.—Extension of the Freeway northward from Strawberry Street along the bed of the canal to U. S. Route 1 at Bakers Basin in Lawrence Township and the extension of the Freeway southward from Lewis Street (Point southward from Lewis Street (Point C on the map) along the filled-in canal bed to Lamberton Road and from there to U. S. Route 130 at Bordentown. Total cost of these two extensions is estimated at $4,500,000.

2.—Extension of Lafayette Boulevard westward from Calhoun Street (point D on map) along the route of the old Water Power (now called Sanhican Creek) to Sanhican Drive, which becomes Route 29 at the city line. The State Highway Department plans to fill in the creek and construct a six-lane limited-access road on top of the fill. Since this road would run along the bank of the Delaware, there would be no problem with cross streets, underpasses or overpasses. The cost has been estimated as $3.75 million.

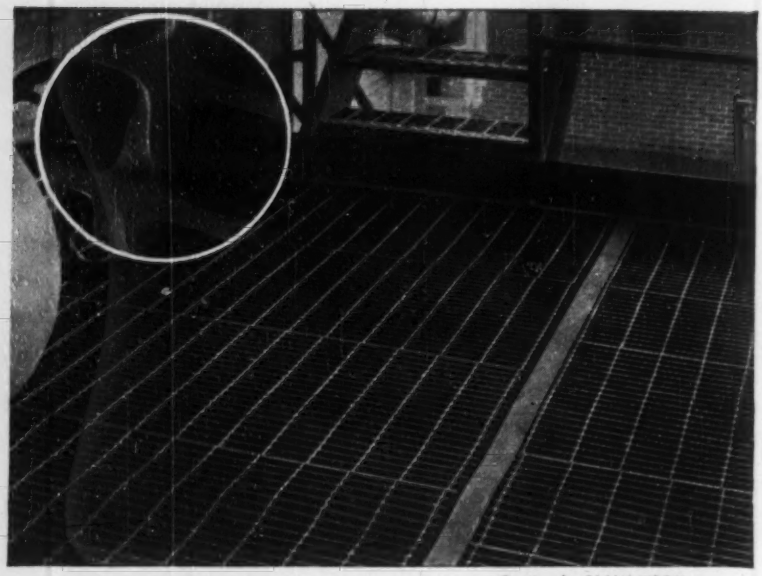
3.—Construction of Assunpink Way. This may be the most ambitious and costly project of all. The State plans to build an elevated highway over the Assunpink Creek from John Fitch Way, through the heart of the mid-city retail shopping area, connecting with the Freeway distribution plaza at the intersection of Stockton, Market and Clay streets (Point E on map). It would provide the only direct, high-speed link between the Trenton Freeway, a north-south road, and the Lafayette Boulevard—Sanhican Parkway route, which is essentially for east-west traffic. The cost has been estimated at anywhere from $7,000,000 to $15,000,000, depending on the type of road to be constructed.

All told, the highway builders will have spent between $37,000,000 and $50,000,000 by the time the six steps in the traffic relief program have been completed. But it would have been a lot more than that if the river, the canals and the creeks had not been there to give the highway builders a ready-made right-of-way.

Storage basin for dairy state

The Wisconsin Valley Improvement Co., of Wausau, Wis., has pro-

(*Continued on page 50*)



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posed creation of a 27,500-acre man-made lake on the Little Eau Pleine River northeast of Marshfield, Wis.

The company has asked the state's public service commission to approve the $6-million project that would result in an 18-mile-long by seven-mile-wide reservoir.

The reservoir practically would double the capacity of the WVIC's system of 21 other reservoirs maintained to regulate the flow of the Wisconsin River between its source and Praire du Sac, Wis.

While the proposed basin would have no power generating facilities, it would increase available production by 72 million kwh annually in existing plants and save an estimated 36,000 tons of coal per year.

Sludge humus price drops—city may halt production

After six years of drying sludge from main sewage treatment plant for fertilizer, the City of San Diego, Calif., has decided that it is not only a losing proposition, but doomed to be prohibitive in the foreseeable future.

That is the finding of O. W. Campbell, city manager, as voiced in a special report to the mayor and city council recently. After reviewing possible plant modifications, Campbell came to this conclusion:

"In any event, there is little possibility that the city would profit from this operation. It simply would be a decision as to which disposal method is the least expensive."

Campbell's report noted that the city's present main treatment plant on San Diego Bay was redesigned in 1948, and a study at that time indicated fertilizer production as the most economical method of sludge disposal. His report continued:

"The contract price for the product at that time was $20 per ton. During the past four years, however, the price of fertilizer of this type dropped appreciably, so that now the average revenue per ton is $6.12.

A factor in the depressed price has been the completion of the Los Angeles Hyperion plant that contributes about 150 tons per day to the available market. Increased supply has obviously affected the economics of San Diego production.

Some design difficulties, and the fact that the city's plant is operating at a peak capacity (extracting less solids than originally anticipated), have resulted in a cost per ton of approximately four times the amount of the revenue recovered.

• **Some alternate sludge disposal methods**—Some of the alternate methods of disposing of sludge cake have been:

(1) Disposal of sludge cake in sanitary land fill,

(2) Disposal in drying beds at some remote location for sale in bulk to ranchers,

(3) Hauling of sludge cake to Mission Bay Park to be disked into land areas where it would be beneficial in building up the soil.

• **Study modification of plant**—New modifications to the treatment plant are being studied. If such alterations resulted in greater efficiency and greater solids extraction, feasibility might be found for the fertilizer production.

There is the possibility, however, that regardless of the modifications, fertilizer production would be impractical. It is certain that there is little possibility that the city would "profit" from the operation. It will evolve into a decision as to which disposal method is the least expensive.

Municipal briefs . . .

• **New schools for Las Vegas, Nev.**—A new bond issue for the construction of school facilities at Las Vegas is in prospect within the next year. If enrollment in the schools continues at its present pace, according to R. Guild Gray, school superintendent, the issue is practically assured.

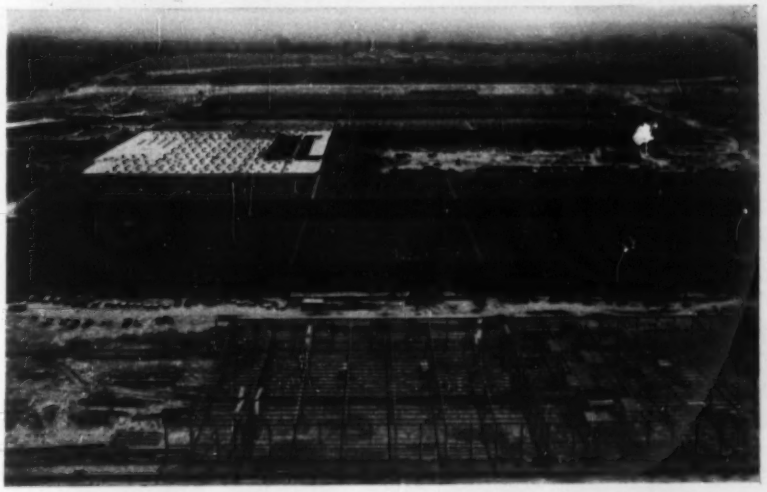
• **Modernization program for Altoona, Pa.**—A resolution turning over control of the water bureau to the Altoona City Authority as the initial step in construction of a billion-gallon reservoir and other water improvements has been approved by that city's council. The $3.5-million modernization program will extend over four years.

• **Downtown parking structure**—The Milwaukee, Wis., Common Council is planning a six-level, million dollar, 500-car garage on a site already acquired at a price of $195,000. The council has instructed the parking commission to submit to them within 90 days a preliminary plan for the structure.

• **Vote on sewer unification**—Voters in metropolitan Phoenix, Ariz., will decide on a unified sewer system Aug. 17. The $6-million plan will affect city as well as fringe district property owners. Should city voters veto the plan, sanitary district residents are considering construction of their own disposal plant.

(Advertisement)

New streamlined construction methods speed completion of $33-million army depot...



PART OF HUGE SIGNAL CORPS DEPOT at Tobyhanna, Pa., a project for U.S. Army Corps of Engineers. Roof construction features two-inch layer of gypsum pumped into place atop one-inch glass-fiber insulation boards set between steel T-purlins. ***Architect-Engineers: Gilboy & O'Malley.***

Current Merritt-Chapman & Scott project features plastic domes to daylight big pumped-gypsum roof.

Construction of the vast U. S. Signal Corps Depot at Tobyhanna, Pa. marked the debut of several new techniques expected to become standard practice for the industry.

These techniques included the utilization of new simplified formwork for the foundation, the use of hung-span roof construction requiring less steel than simple-beam construction, and the use of plastic skylights on a huge pumped-gypsum roof.

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FOUNDATION WALLS at Tobyhanna were speeded by use of 2′ x 8′ prefabricated wood panels. Through-wall ties eliminated drilling of tie holes. On 8.1 miles of walls and foundations, panels were re-used an average of 10 times.

TRANSPARENT PLASTIC DOMES, with temporary thin protective coating, are set in aluminum frames to form skylights.

NEW AIR TERMINAL for London Airport, England, lies in center of field and is approached by a 2,060-ft tunnel (mouth at upper left in photo) under runways. Under construction are the Southeast Face Building (foreground) and the Eastern Apex Building for a diamond-shaped terminal area. Main operational building is in center and more buildings are planned for the future for other sides of the terminal area.

London's new air terminal is centered in middle of field, has access by tunnel

Few passengers landing at London Airport, England, notice the island of new construction going on in the middle of the huge field criss-crossed by runways. Centered in the middle of the field is one of the world's most modern air terminals—$100-million project to replace the string of miscellaneous temporary buildings, along the edge of the field, that now serve as the main terminal.

The obvious problem of approach to a terminal in the middle of an airfield is taken care of by a 2,060-ft tunnel running from the edge of the field to the new main terminal. Including both inbound and outbound cyclists' lanes and pedestrian ways, the 83-ft-wide tunnel has four 10-ft-wide vehicle lanes with 23-ft clearance. At peak hours the tunnel will handle 2,000 vehicles per hour in each direction, according to estimates.

The central control tower and main airport operational offices of the new terminal are expected to go into operation near the end of this year. The Southeast Face Building is about half done, with six of ten passenger channels expected to be in operation by March of next year. The Eastern Apex Building recently has been topped out with structural steel and is scheduled for use by December of 1955. This building will house custom clearance for airline crews, offices, theater, exhibition hall and restaurant.

Present estimates are that the terminal by 1960 will handle 4,500,000 passengers a year, and for this reason three sides of the diamond-shaped terminal area have been left open for future detailed planning.

All four sides of the area lie parallel to runways, the airport being laid out on a twin parallel system—a runway each for simultaneous takeoff and landing. There are four short vehicular tunnels under each set of runways to take passengers disembarking or embarking from a far-side apron to the terminal proper.

The terminal was designed by Frederick Gibberd; construction of buildings and tunnels is being carried out by Taylor, Woodrow Construction Ltd., and the runways were built by Wintey Ltd., all of London.

Italian irrigation plans involve 2-million acres

A series of projects now under way in Italy will provide irrigation for more than 2,000,000 acres of agricultural land.

In northern and central Italy, plans for irrigating 1,100,000 acres and completing work on an additional 395,000 acres call for some 450 cu meters of water per second. One of the chief works involved is construction of the Elena Canal in Piedmont province to carry Ticino River water to 32,000 acres near Novara and Vercelli. In Apulia province, the first dam is being built in the Ofanto River basin to irrigate some 59,000 acres. Other big projects: irrigating and improving 345,000 acres around Mantua and Parma, 247,000 acres near Ferrara, and 138,000 acres between Verona and Gorizia in what is now uncultivated alluvial lands of the Alpine foothills.

In southern Italy, some 980,000 acres will be irrigated with the help of 25 reservoirs containing a total of 1.5-billion cu meters of water. The Bradano, Agri and Sinni river basins in Lucania province will be used to irrigate 59,000 acres and generate 250-million kwh of electric power. In Calabria province, the Silla River will be used to increase power output and irrigate some 61,000 acres on slopes descending to the Ionian Sea.

Sicily's Simeto River will be used to water 74,000 acres in the plain of Catania and to generate 250-million kwh of power. On the island of Sardinia, the first two large dams and principal canal are being built in the Flumendosa River basin to irrigate 98,000 acres, and to supply water and 125-million kwh of power to Cagliari and 22 other communities.

New block-size post office slated for Vancouver, B. C.

The contract for construction of the new Vancouver, B. C., post office has been awarded to a Vancouver firm—Smith Bros. and Wilson—on a bid of $9,628,000, lowest of seven submitted.

The block-size building will be 260 ft x 448 ft and have 630,000 sq ft of space. One section will be four stories high. Another section—a 9-story one— will have landing space on the lower roof for helicopters. An underground tunnel will be equipped with an automatic conveyor system to transfer mail directly to the railway station.

Colonization plan creates new Colombian industries

For the first time in its history, Colombia is undertaking a wholesale immigration and colonization program—one that will open up new industries and opportunities for foreign investments.

The Institute of Colonization and Immigration was set up last July with a fund of $40 million to carry out the program. This year's budget amounts to $4.2 million, and an Institute mission already has left for Europe (reportedly Spain, Italy and Germany) to select immigrants.

The main colonization site—more than 123,000 acres of tropical woodlands—is located on the banks of the Magdalena River in the Carare area near Puerto Agudelo. Penetration roads as well as roads connecting the area with two communication centers—La Dozada to the south and Barrancabermeja to the north—are under construction.

An integrated industrial plan is being worked out for the use of wood coming from 100 different tropical species. About 600 tons of wood a day will be cut down and transported to the neighboring village of Cimitarra. There, a wallboard factory—first of its kind in the country—will be built by a new company now seeking $1 million in foreign capital. Another recently founded firm will construct a sawmill.

Other new industries—prefabricated wooden houses, for example—are in the planning stage.

The Carare project is the first to be carried out by the Institute. Colonization of both the Sumapaz region south of Bogota and the eastern lowlands are planned for the future.

United Press photo

Drive-in bank features cantilevers on stilts

In Mexico City's Lomas de Chapultepec suburb, a new drive-in bank cantilevers past the column line above the open street level floor to provide spacious offices at second floor level and four open traffic lanes at ground level for car-to-teller banking. Above the roof, the reinforced concrete structure has a shaped canopy resting on central supports to provide daylighting over the central section of the main offices. Glass, tile and brick form the exterior walls.

International briefs . . .

• **Skyscraper idea scrapped**—Toronto has turned down the offer of a Chicago investment group (Norman Barnes & Co.) to build a $75-million, 51-story office building on the site of Toronto's present city hall. The plan called for the skyscraper to house city offices (ENR, May 27, 1954, p. 76)—and Toronto officials decided it would not be fitting to have the deed to the city hall in another country.

• **Port extension plan**—India has called for bids on the southward extension of the port of Madras. Harbor works will include construction of jetties and an approach head for proposed ore and coal berths. Total cost of the project is estimated to be about $2 million.

• **Island industrialization**—British Columbia and several B. C. timber corporations are seeking agreement on plans for a $50-million forest development program on Vancouver Island. The firms have applied for forest management licenses covering large sections of government timberland in the southwest areas of the island. A $30-million pulp mill reportedly would be part of the industrial expansion. Highway construction—including a long-sought road for the island's west coast—hinges upon completion of an agreement between British Columbia and the lumber firms. One of the first roads to be built would be a 30-mi one from Port Alberni to Tofino.

• **Indian hydro funds**—India will allocate proceeds from the sale of $5-million worth of wheat supplied by Canada in 1952-1953 to the $33.1-million Mayurakshi hydroelectric and irrigation project in West Bengal. Funds raised for this project out of Canada's economic assistance to India now total $17 million. In addition, Canada will provide $3-million worth of hydroelectric equipment. When completed (1955-1956) the Mayurakshi project is expected to irrigate from 120,000 to 600,000 acres, generate about 2,000 kw of firm electrical power, and result in production of over 400,000 additional tons of food grains per year.

• **Power plant project**—Uruguay has invited bids for the construction of another hydroelectric plant on the Rio Negro at Rincon de Baygorria. Site of the new facility will be downstream from the present Rincon del Bonete plant.

• **World water needs**—In a report to the United Nations, U. S. Soil Conservationist Walter C. Lowdermilk warns that industry's rapidly rising demands on the world's water resources require highest-level planning. Dr. Lowdermilk—hired by the UN to make a survey showing possible approaches to an integrated plan for development and use of water resources—noted that by 1975 industries might need as much as two-thirds of all available sweet water.

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MEN AND JOBS

Col. E. M. Eads assigned to new construction post

Col. Edwin M. Eads, assistant for the Air Force with the Joint Construction Agency in Paris, has returned to the United States after completion of a three-year tour of duty. He goes to a new position as Air Force Installations Representative with the Office of the Division Engineer, South Pacific Division, San Francisco.

Colonel Eads, a 1937 graduate in architecture from Texas A & M in 1948, was in charge of all Air Force construction at the Guided Missiles Test Center, Alamogordo, N. M., and later at the Joint Long-Range Proving Ground, Patrick Air Force Base, Cocoa, Fla. In September, 1951, when he was shifted to Paris, he became Installations Representative for the U. S. Air Force, Europe, and was in direct charge of all Air Force construction in France until formation of JCA in January, 1953.

New naval duties ahead

Comdr. Peter Corradi has reported for duty as district public works officer at Sixth Naval District Headquarters, Charleston, S. C. His last previous assignment was with the Bureau of Yards and Docks in Washington, D. C., where he served as deputy to the assistant chief for operations.

Commander Corradi, a graduate of New York University, entered the Navy in 1940 as a lieutenant (jg) in the Civil Engineer Corps. During World War II he served with the Seabees in the Pacific Theater.

Career briefs . . .

• **Degree for dam builder**—Thomas J. Walsh, Sr., board chairman of Walsh Construction Co., received an honorary Doctor of Law degree from Pepperdine College during the college's second annual American's Builders Recognition Night held in Los Angeles. Walsh was honored along with other builders associated in the construction of Grand Coulee Dam.

• **Engineering examiner retires**—Peter F. LaValle has retired as engineering examiner for the U. S. Civil Service Commission in Washington, D. C. Prior to his appointment to the commission staff in 1942, he was responsible for hydraulic studies and construction work (largely in the West) for several engineering organizations.

Receives honorary degree

Victor E. Vallet, president of Giffels & Vallet, Inc., L. Rossetti, Detroit, was awarded an honorary Doctor of Engineering degree during June commencement exercises at the University of Colorado—the same university where he received his B.S. in civil engineering in 1916. Before forming his own firm in 1925 with Raymond F. Giffels, Vallet worked for Albert Kahn Associates in Detroit, where he was in charge of building many of the Ford Motor Co.'s large one-story factories.

• **Commission chief**—Orville W. Chinn, conservationist and construtionengineer, has been appointed director of Kentucky's new Strip Mining and Reclamation Commission. Since 1949 he has been director of the state's Division of Flood Control and Water Use.

• **Adviser on asphalt**—Raleigh W. Gamble, superintendent of Milwaukee, Wis., street construction and repair for the last 30 years, will retire in July to become a consultant for the Asphalt Institute. He will open a regional office in Chicago to serve Illinois and Wisconsin cities with special problems in asphalt paving.

• **Joins engineering firm**—Norman J. Frank has joined the firm of Beck, Simon & Mentel, structural engineers of Jersey City and New York City.

• **Corps division chief**—Carter Page has been promoted to chief of the Planning and Development Division, Civil Works, in the Army Engineer Chief's office. He has been assistant division chief since 1948. George L. Beard, former division chief, resigned to join Pacific Power & Light Co., Portland, Ore.

OBITUARIES

William F. Trimble, Jr. 60, president of the Trimble Co., old construction firm of Pittsburgh, died at Bellevue, Pa., June 18. A 1916 graduate of the University of Pittsburgh, Mr. Trimble became head of his company in 1937, in succession to his uncle, the late William L. Trimble. Mr. Trimble's father was president of the company when it built the old Pennsylvania Railroad warehouse in 1904. When that structure was razed two years ago for the Point Park project the company built the new Pennsylvania warehouse on Liberty Avenue. The Post-Gazette building and the Bell Telephone building are among the downtown structures erected by the company. The firm has the current Pennsylvania Station remodeling job.

R. G. Roberts, 63, technical engineer of the Barrett Division, Allied Chemical & Dye Corp., died June 16 in Chicago. He joined Barrett 33 years ago and was recognized as an authority on pipeline construction, particularly having to do with the protective coating system now generally adopted in the industry.

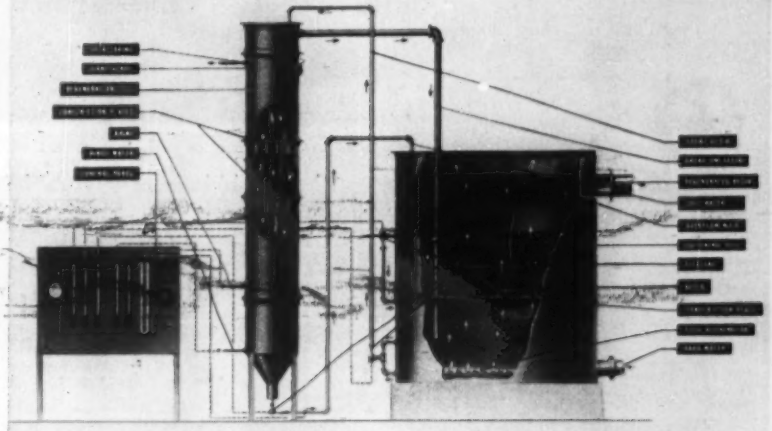
Frederick D. Foss, 59, president of Foss, Halloran, Narr, Inc., construction engineers, died in New York City, June 1. He was a 1917 graduate of Massachusetts Institute of Technology. He had been vice-president of Corbetta Construction Co. before he founded his company in 1947.

Norvin K. Dickerson, 60, of Monroe, N. C., pioneer road contractor in the Southeast, died June 1. He went to Monroe in 1931 as an officer of the R. B. Tyler Construction Co. having charge of many road construction projects. In 1943, with several Tyler executives and his eldest son, M. K. Dickerson, Jr., he organized the firm of Dickerson, Inc., of which he was chairman of the board at the time of his death.

John William Hill, 64, civil engineer of Little Rock, Ark., employed for the last 30 years by the Van Trump Testing Laboratory of Little Rock and Chicago, died at Chicago June 19. He was a graduate of the University of Illinois.

Harry E. Lindley, 70, civil engineer with Robert & Co. Associates, died in Atlanta, Ga., June 15. A graduate of Georgia Institute of Technology, he had worked actively in the engineering field for 50 years.

Look what's happened to Ion-Exchange



Illustrative drawing of the Dorrco Hydro-Softener. Note that regeneration is carried out in a separate tank from the softening cell to minimize danger of contaminating treated water.

It's Gone Continuous!

Infant prodigy of the Process Industries, ion-exchange has often been a problem child as well. Batch operation has been one of its major limitations in today's age of continuous processing.

Now, for the first time, the base or cation exchange cycle has been put on a completely continuous basis through the Dorrco Hydro-Softener. Originally developed for softening municipal and industrial water supplies, the Hydro-Softener has definite operational and economic advantages over conventional batch systems. And the basic principles show promise in many other fields as well.

Whenever a process involves the use of ion-exchange, the separation of finely divided solids in suspension, or fluidizing techniques, Dorr and its Associated Companies throughout the world can provide the correct equipment for the job.

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CONSTRUCTION REPORTS

Bids Asked—Low Bidders—Contracts Awarded—First Section—

Compiled by Business News Department—Engineering News-Record, 330 W. 42nd St., New York 36, N. Y., ELSIE EAVES, Manager
J. A. MAHONEY, M. O. WETZEL, L. M. WINISKI, M. E. SCIORRA, F. S. DEMBEK, Reports.
J. H. WEBBER, M. R. ROESSLER, E. R. HUBER, Statistics.

NEW ENGLAND

BIDS ASKED—BUILDINGS

▲ **Mass., Newton**—SCHOOL—BA 7/13—City, P. Bldg. Comn, City Hall, Meadowbrook Junior High School, Oak Hill, $1,500,000. Plans deposit $50 refundable, Howard L. Rich & Herman F. Tucker, 45 Newbury St., Boston, archts. CD 2/5/53.

▲ **Conn., Willimantic**—SCHOOL—BA 7/21—State of Conn., Ralph G. Macy, P. Wks. Comr. State Office Bldg., Hartford, brick, concrete Windham Regional Technical School, Upper Birch St., east of and adjacent to Knight Field, $1,000,000. Plans deposit $100. Joseph Della Valle, 153 Court St., New Haven, archt. Arthur G. Beaulieu Assoc., 2348 Whitney Ave., Hamden, Conn., structural engr. CD 10/15/53.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

† **Platt Constr. Co., Inc.**, 99 First St., Cambridge, Mass. LB **$368,000.** est. $400,000-$500,000. wing headquarters bldg., Hanscom Air Force Base, Eng. 19-016-54-114, BEDFORD, MASS. U. S. Eng., 857 Commonwealth Ave., Boston, Mass. Bids June 15. CD 5/26.

▲ **RHODE ISLAND**—State of R. I. and Prov. Plantations, F. A. Adams, purch. agent, State House, Providence,

Harris Structural Steel Co., 419 Fourth Ave., New York, N. Y., LB **$3,816,777**, est. $4,000,000. Contr. 5453, constr. superstructure of Sakonnet River Bridge-Sakonnet River, Tiverton-Portsmouth. Bids June 16. CD 5/21.

BUILDINGS

LOW BIDS AND CONTRACTS

R. S. Noonan, Inc., 26 N. Duke Ave., York, Pa., CA **$300,000.** women's DORMITORY, MIDDLEBURY, VT. Middlebury College, Middlebury, Vt. CD 5/26.

G. L. Rugo & Sons, Inc., 80 Boylston St., Boston, Mass. LB **$917,000.** P-104 Contr. 4, INDUSTRIAL BLDGS. and GARAGE, New State Prison, NORFOLK, MASS. Dpt. Correction, State House, Boston, Mass. Bids June 16. CD 5/28.

Sciaba & Co., Inc., 86 Shawmut Ave., Boston, Mass. LB **$568,900.** est. $550,000. high SCHOOL addn. Pauline St., WINTHROP, MASS. Town, 45 Pauline St., Winthrop, Mass. Bids June 14. CD 5/25.

▲ **Contemporary Homes, Inc.**, Adgar Beausoleil, pres., Kilby Rd., South Windsor, Conn., Owner Builds, **$1,000,000** RESIDENCES, Kilby Rd., SOUTH WINDSOR, CONN.

▲ **Bouffard Brothers**, Rockville, Conn., CA **$1,250,000** 50 RESIDENCES, Crestwood Tract, TOLLAND, CONN. Crestline Realty Co., Rockville, Conn.

MIDDLE ATLANTIC

BIDS ASKED—HEAVY CONSTRUCTION

▲ **NEW JERSEY-PENNSYLVANIA**—BA 7/15—Delaware River Port Auth., Administration Bldg., Bridge Plaza, Camden, N. J.

Contract P-1, grading, embankment and sewer load relieving structure for approaches in Phila., Pa. to new bridge between Packer Ave., Phila., Pa. and Gloucester, N. J. Plans deposit $10. CD 9/26/52.

NEW YORK—BA 7/20—Jones Beach State Parkway Auth., Belmont Lake State Park, Babylon,

Nassau Co.—Contr. 1, widening, incl. grading, paving, misc. work for the reconstr. of a portion of the Wantagh State Pkway. Merrick Rd. to Jones Beach State Park. Brown & Blauvelt, 468 Fourth Ave., New York Zone 16, engrs.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ **NEW YORK**—Bureau Contracts & Accounts, The Governor Alfred E. Smith State Office Bldg., Albany,

S. J. Groves & Sons, Inc., Empire Bldg., Syracuse, N. Y. CA **$1,479,138**, est. $1,793,000, c. conc. 3.69 mi. b. conc. opt. 0.48 mi., bit. application and stone cover 0.21 mi., 4.38 mi. Syracuse: Park St. to North City Line, Syracuse-Mattydale, Luther Ave., Access Rd. and Co. Rd. 208 connection, Syracuse-Cicero, SH 5470 and Acc. Rds., Mattydale Interchange, Proj. UI 463 (9), Contr. No. FAC 54-3, FASH 54-3, FASS 54-5 FARC 54-53, Onondaga Co. Bids May 6. CD 5/11, under LB.

▲ **NEW YORK**—Triborough Bridge & Tunnel Auth., Admin. Bldg., Randall's Island, New York Zone 35,

Horn Constr. Co., Inc., 2174 Hewlett Ave., Merrick, N. Y. CA, **$2,771,681.** Contr. QME-4, Queens Midtown Expressway, 80 St. to Queens Blvd. and bridges over 74 St. and New York Connecting R. R., Queens Boro. Bids June 2. CD 6/10, under LB.

† **Reid Contrg. Co. Inc.**, Woodbridge, N. J., CA, **$133,000**, Airfield-Soil Conservation (grading and site imprvs.) NOY 82566. Spec. 42612. LAKEHURST, N. J. Dpt. Navy, Phila., Naval Base, Phila., Pa. CD 7/30/52.

Myers & Quigg Inc., 910 St. S. E. Wash., D. C. CA, **$431,999.** repairing asph. pavements and concrete base at various locations, WASH., D. C. D. C. Govt., Dpt. Hys., 499 Pa. Ave. N. W., Wash., D. C. Bids June 8, awarded June 15. CD 6/14, under LB.

BUILDINGS

LOW BIDS AND CONTRACTS

Edenwald Contr. Co., 151-45 6th Rd., Whitestone, N. Y., LB, **$243,744**, streets and yards;

Roman Landscape Contr. Co. Inc., 1611 E. 233 St., New York 66, N. Y., LB, **$192,697**, topsoil and planting for HOUSING IMPRVS. Proj. NYS 58-2, Cypress Hills Houses, BROOKLYN, N. Y. New York City Housing Auth., 299 Broadway, New York 7, N. Y. Bids June 1.

Edenwald Contr. Co, 151-45 6th Rd., Whitestone, N. Y. LB, **$105,934**, street and yards;

Philip Lagana, 39-14 209 St., Bayside, N. Y., LB, **$71,000**, topsoil and planting for Forest Houses, HOUSING IMPRVS., Sect. I (Proj. NYS-57) in area bounded by E. 165 St., Tinton Ave., E. 166 St., Trinity Ave., and area bounded by E. 165 St. and a line parallel to and 280 ft. south of Southerly curb of E. 165 St. and by Trinity Ave. and a line parallel to and 185 ft. east of easterly curb of Trinity Ave., Bronx Boro. NEW YORK, N. Y. New York City Housing Auth., 299 Broadway, New York 7, N. Y. Bids June 8. CD 5/21.

▲ **Castagna & Son, Inc.**, 115-10 Jamaica Ave., Jamaica, N. Y., CA, **$5,644,316**, general constr.;

Gasman Plumbing & Heating Corp., 327 Hicks St., Brooklyn 2, N. Y., CA, **$917,324**, heating and ventilating;

E. J. Electric Installation Co., 235 E. 42 St., New York 17, N. Y., CA, **$717,275**, electrical work;

Jarcho Bros., 38-18 33 St., Long Island City, N. Y., CA, **$786,858**, plumbing for constr. CITY PRISON AND REMAND SHELTERS, Atlantic Ave., Boerum Pl., Smith and State Sts., BROOKLYN, N. Y. Dpt. Public Wks. Municipal Bldg., New York 7, N. Y. Grand Total, $8,065,773. Bids May 5. CD 5/7, under LB.

Country Gardens, 36 South Center Ave., Rockville Center, N. Y. LB, **$106,585**, topsoil and planting;

Edenwald Contr. Co., 151-45 6th Rd., Whitestone, N. Y. LB, **$257,594**, street and yards, HOUSING IMPRVS. Proj. NY-5-27, in area bounded generally by Rockaway Beach Blvd., Beach 81 St., Hammels Blvd. and Beach 86 St., Queens Boro. ROCKAWAY, N.Y. New York City Housing Auth., 299 Broadway, New York 7, N. Y. Bids June 15. CD 6/1.

▲ **Syosset Knolls Homes**, c/o A. H. Salkowitz, archt., 37-60 82nd St., Jackson Heights, N. Y. Owner Builds. **$2,000,000.** 127 HOUSES, 35-acre tract, south side, Jericho Turnpike, west of South Oyster Bay Rd., SYOSSET, N. Y.

▲ **Arlington Constr. Co.**, 15 Beech Road, West Orange, N. J. Owner Builds. **$2,000,000.** 90 HOUSES on tract, The Oaks, WEST ORANGE, N. J. Joachim Hilton, c/o owner, archt.

H. O. Mac Culloch, 319 Madison Rd., Willow Grove, Pa., Separate contracts. **$300,000.** RESIDENTIAL development, Madison Ave., ABINGTON, PA.

▲ **Louis Feldsher & Sons**, 2534 W. Thompson St., Phila., Pa., Separate contracts. **$1,518,000.** RESIDENTIAL development, various streets, HAVERTOWN, PA.

▲ **North Wales Park Homes**, 5000 Woodbine Ave., Phila., Pa., Separate Contracts. **$3,000,000.** RESIDENTIAL development, East Norriton Twp., North Wales and Township Line, NORRISTOWN, PA. J. Ethan Fieldstein, 1325 Walnut St., Phila., Pa. archt.

▲ **Tudor Constr. Co.**, 8 Baltimore Ave., Lansdowne, Pa. Separate Contracts **$1,000,000.** RESIDENTIAL development, Golf Club Lane, PAOLI, PA.

McCloskey & Co., 1620 W. Thompson St., Phila., Pa. CA, **$304,000.** est. $436,410, James Elverson SCHOOL, PHILA., PA. Bd. Educ., 21 and Winter Sts., Phila., Pa. James A. Nolen, Jr. and H. T. Swinburn Assocs., 1649 N. Broad St., Phila., archts. Earl P. Allabach, 16 S. Broad St., Phila., Pa., engr. CD 1/12.

▲ **McCloskey & Co.**, 1620 W. Thompson St., Phila., Pa. CA, **$3,387,000.** est. $5,184,172, South Phila., HIGH SCHOOL, PHILA., PA. Bd. Educ., 21 and Winter Sts., Phila., Pa. Davis, Dunlap & Carver, 1717 Sansom St., Phila., Pa. archts. Keast & Hood, 2031 Chestnut St., Phila., Pa. engrs. Bids June 4. CD 5/13.

McCloskey & Co., 1620 W. Thompson St., Phila., Pa., CA, **$302,000.** est. $445,125, Watson Comly SCHOOL, PHILA., PA. Bd. Educ., 21 and Winter Sts., Phila., Pa. Robert E. McLaughlin, 1411 Walnut St., Phila., Pa. engr. CD 4/26.

McCloskey & Co., 1620 W. Thompson St., Phila., Pa. CA, **$307,900.** est. $430,924, Sheppard SCHOOL addns., alterations, PHILA., PA. Bd. Educ., 21 and Winters Sts., Phila. Pa. Robert E. McLaughlin, 1411 Walnut St., Phila., Pa., engr. Bids May 14. CD 4/29.

▲ **Wallace Engr. & Constr. Co.**, Bryn Mawr, Pa., CA **$2,500,000.** DEPARTMENT STORE, PHILA., PA. Oregon Avenue Shopping Center, c/o Wallace & Warner, Bryn Mawr, Pa. archts.

▲† **Charles H. Tompkins Co.**, 907 16 St. N.W., Wash., D. C. LB **$19,944,452.** N.S.A. Proj. operations bldg., appurtenant facilities, Eng. 18-020-54-47, FORT GEORGE G. MEADE, MD. U. S. Eng., 24 St. and Maryland Ave., Baltimore, Md. Bids June 18. CD 5/10.

Howard C. Kinder, Prospect Park, Pa., Separate Contracts. **$310,000.** RESIDENTIAL development, Maryland Ave., PROSPEC. PARK, PA.

† **John J. Driscoll Assoc.**, 18 W. Chelten Ave., Phila., Pa. LB, **$641,874.** POWER PLANT rehabilitation, WASH., D. C. Dist. P. Wks. Officer, Potomac River Naval Command, Naval Gun Factory, Wash., D. C. Rust Engineering Co., 1010 Vermont Ave. N. W., Wash., D. C., engr. Bids June 10.

PROJECTS COVERED

By Size

Construction projects here reported cover the United States and Canada, are of these minimum sizes or larger: water supply, earthwork, waterways $34,000; other public works $60,000; industrial buildings $82,000; other buildings $300,000. Also Foreign projects of $100,000 and more in size of interest to American contractors.

By Regions & Classes of Construction

(In order of Listing)

BIDS ASKED
LOW BIDDERS
CONTRACTS AWARDED

New England	Middle West
Middle Atlantic	West of Mississippi
South	Far West

PROPOSED WORK

Water Supply	Public Buildings
Sewers, Waste Disposal	Mass Housing
Bridges	Commercial Buildings
Streets & Roads	Industrial Buildings
Earthwork, Waterways	Unclassified

In These Stages

PROPOSED WORK: Before and including appointment of engineers or architects.
BIDS ASKED: BA (new announcements only). For full calendar, see also preceding issues.

LOW BIDDERS: LB On jobs below $500,000 in value all low bidder news will be the final reports published on the projects involved except where award is not made to the low bidder. In this case, a supplementary contract award report will be published.

CONTRACTS AWARDED: CA Except awards to low bidders previously reported in low bidder stage.

CD dates shown are of Construction Daily issue in which last previous report was published.

Symbols and Abbreviations Include:

†	Federal Government
▲	Project of $1,000,000 or over.
ENR	Engineering News-Record
CD	Construction Daily

For additional reports see Construction Daily.

SOUTH

BIDS ASKED—HEAVY CONSTRUCTION

La., Pointe a la Hache—ELECTRIC LINE—BA 7/13—Town, installing a 2,400 volt electric line crossing over Bayou Plaquemine. Proposal A, tower fdn.; Prop. B, electrical work. Plans deposit $5.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

Wiley N. Jackson Co., R.F.D. 4, Roanoke, Va., LB, **$560,715**, concrete pipe line; LB, **$524,075** steel pipe to connect main sewers on the North side of the river with the main treatment plant on the south side. RICHMOND, VA. City, Mosque Bldg., Laurel and Main Sts., Richmond, Va. Bids June 15. CD 5/11.

Koller Constr. Co., 1814 High St., Houma, La. CA, **$428,175.** alterations, addns. to water treatment, HOUMA, LA. City, Houma, La. Bids June 11. CD 6/3.

▲† **Hardaway Constr. Co.**, 15 E. 11 St., Columbus, Ga. LB **$4,200,000.** Green River 10 mi. up from Ohio River, reconstr. Lock No. 2, 68,500 cu. yd. concrete, 701,000 lb. rein. steel, 37,000 sq. ft. sheet piling,

(Continued on page 58)

LIMA Type 2400 dragline stripping overburden at open cast coal site in Northern England.

Two LIMA Machines working on harbor construction project in Aden.

George Wimpey & Company, Ltd. report:

"We purchased our first **LIMA** in 1947. Today we rely on **50 LIMAS** in United Kingdom, Aden, South Africa and Borneo"

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After their first machine in 1947 proved very satisfactory, Messrs. Wimpey decided to standardize on Lima machines for all large excavators not made in the United Kingdom. This standardization has benefited them two ways:

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BEFORE you buy any machine, **COMPARE** carefully all important features **LIMA** offers you:

1. Bronze bushings in tread, idler and drive rollers are protected by piston-ring type dirt seal rings and retainers.
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6. Machine cut propel and swing gears and roller chain power take-off are enclosed in a sealed oil bath for dirt elimination and smoother, quieter operation.
7. Torque converter (optional) automatically adjusts speed to load requirements, minimizing shock loading, making performance smoother and faster. (Standard on Type 2400 shovel).
8. Full air controls on travel, hoist, swing and boom hoist, result in smoother, more precise operation, minimum maintenance and less operator fatigue.

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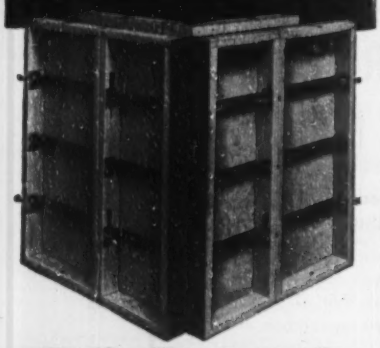

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- BATTERED WALLS
- CURVED WALLS
- SLABS

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(Continued from page 56)

Spottsville, KENTUCKY. U. S. Eng., 830 W. Broadway, Louisville, Ky. Bids June 17. CD 5/19.

▲ **KENTUCKY**—Commonwealth of Ky., Dpt. Hys., Frankfort,

Breslin Constr. Co., 1433 S. Preston St., Louisville, Ky. and **R. B. Tyler Co.**, 1446 Levering St., Louisville, Ky. CA **$1,989,206.** combination Contrs. 3-A and 3-B Kentucky Turnpike Proj. No. 1. Bids **June 18.** CD 5/28.

Geo. M. Eady Co., 340 Byrne St., Louisville, Ky. LB, **$554,000.** overpass Burnett St., LOUISVILLE, KY. City, City Hall, Louisville, Ky. W. W. Sanders, city engr. Bids June 15. CD 11/23/51.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **Baker & Coombs, Inc.**, 601 E. Broadway, P. O. Box 635, Morgantown, W. Va., CA, Total est. **$13,000,000.** grading, site preparation, railroad water supply and some buildings at Silicones PLANT Long Reach near ST. MARY'S, W. VA. Union Carbide & Carbon Corp., Linde Air Products Div., 30 E. 42 St., New York 17, N. Y. (Correction—contractors name). CD 6/1, under CA.

Horace B. Rickey, Inc., Box 218, Lafayette, La. CA, **$449,349.** Lafayette Parish War MEMORIAL Health & Civic Center bldgs., LAFAYETTE, LA. Lafayette Parish Police Jury, Lafayette, La. Bids June 11. CD 5/19.

Cecil Chadoir, Box 507, Alexandria, La. LB, **$379,300.** DORMITORIES, State Colony & Training School, PINEVILLE, LA. State Div. Admin., State Capitol, Baton Rouge, La. Bids 9/15 rejected. CD 9/22/53, under CA.

▲† **Allis-Chalmers Mfg. Co.**, Chattanooga Bank Bldg., Chattanooga, Tenn., LB **$6,601,171**, est. $6,000,000. design, furnish and install TRANSONIC CIRCUIT of propulsion wind tunnel at Arnold Engineering Development Center, TULLAHOMA, TENN. U. S. Eng., Tullahoma, Tenn. Bids Apr. 20. CD 3/12.

MIDDLE WEST

BIDS ASKED—BUILDINGS

▲ **Ill., Naperville**—SCHOOL, etc.—BA 7/8—School District 107, Aurora Ave., high school and gymnasium, $1,000,000. Thos. J. Higgins, 228 N. LaSalle St., Chicago, Zone 1, archt. CD 12/10/52.

▲ **Ind., Anderson**—HIGH SCHOOL—BA 8/15—Anderson School City, G. E. Ebbrrt, Supt. Schools, 520 W. 11 St., Junior High School. $1,000,000. Plans deposit $25. Arthur Henning, Anderson Bank Bldg., archt. CD 2/24.

SOON LETS CONTRACT—BUILDINGS

▲ **Ill., Chicago**—PLANT—International Salt Co., 228 N. LaSalle St., soon lets contract, bagging and storage plant, 520 ft. dockage, $1,000,000. Paul Weir & Co., 20 N Jackson St., Chicago, Zone 6, engrs. CD 5/14.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ **Traylor Bros., Inc.**, upper Mt. Vernon Rd., Evansville, Ind. CA **$1,984,367** treatment plant; CA **$334,-700** pumping station;

Santucci Constr. Co., 5025 Church St., Skokie, Ill. CA **$428,296.** sanitary sewer; CA **$1,192,385.** intercepting and effluent sewer, EVANSVILLE, IND. Bd. P. Wks., City Hall, Evansville, Ind. Grand total $3,939,748. CD 6/17, under CA.

L. A. Wells Constr. Co., 1121 Schofield Bldg., Cleveland, O. LB **$773,518.** Detroit River bulkhead Contr. MH-13C, DETROIT, MICH. City, G. R. Thompson, city engr., Guardian Bldg., Detroit, Mich. Bids June 15. CD 6/4.

BUILDINGS

LOW BIDS AND CONTRACTS

Henry Kappen, Clarona Dr., Cincinnati, O., CA **$331,537.** est. $625,000. ELEMENTARY SCHOOL, Race Rd., CINCINNATI, O. Bd. Educ. of Bridgetown, Harrison Pike, Cincinnati, O. Awarded June 7. CD 5/5.

Associated Builders of Columbus, Inc., 1580 King Ave., Columbus, O., Owner Builds, **$300,000.** 15 two-story concrete block DWELLINGS, Olmstead Ave., COLUMBUS, O. CD 3/4.

▲ **Associated Builders of Columbus**, 1789 N. 4 St., Columbus, O. Owner Builds. **$1,000,000.** 127 unit concrete block rental HOUSING, COLUMBUS, O. CD 3/4.

▲ **C. W. Sharp & Sons, Inc.**, 4200 Prescott St., Dayton, O. Owner Builds. **$1,000,000.** 93 frame, ranch style HOMES along Larkspur Dr., Prescott Ave. and Middlehurst Lane, east of Gettysburg Ave., DAYTON, O. CD 12/29/53.

Columbus Constr. Co., Columbus, Ind., Owner Builds. est. $300,000. HOMES in North Franklin, FRANKLIN, IND.

Good Homes, Inc., Circle Tower, Indianapolis, Ind. Owner Builds. **$500,000.** HOMES east side, INDIANAPOLIS, IND.

Allied Builders Inc., Lebanon, Ind. Owner Builds. est. $300,000. National HOMES, LEBANON, IND.

Randolph Lumber Co., Parker, Ind. Owner Builds. est. $300,000. HOMES in Parker and vicinity, PARKER, IND.

A. L. Jackson, 161 E. Erie St., Chicago, Ill., LB, **$969,959** PARKING GARAGE, 875 Rush St., CHICAGO, ILL. City, City Hall, Chicago, Ill. Bids June 17. CD 6/4.

▲ **J. W. Snyder Co.**, 307 N. Michigan Ave., Chicago, Ill., CA, **$2,500,000**, Y.M.C.A. Bldg. and pool, LAGRANGE, ILL. Young Men's Christian Assn., West Suburban Unit, 433 Sunset Ave., La Grange, Ill. Bids May 17, awarded June 16. CD 5/12.

▲ **Johnson Drake & Piper, Inc.**, 112 N. 7 St., Terre Haute, Ind. CA **$3,000,000.** brick, steel, concrete, central dialing TERMINAL, GRAND RAPIDS, MICH. Michigan Bell Telephone Co., 1365 Cass St., Detroit, Mich. Bids May 20. CD 5/7.

▲ **Division Avenue Lumber Co.**, 3501 Division Ave., S., Grand Rapids, Mich. CA est. **$5,500,000.** 440 single HOUSES, SHOPPING CENTER, misc. stores, streets, utilities on 120 acre site, PARIS, MICH. Eastern Heights Development, Fred R. Maranda and Donald C. Carrick, 34 36 St. S E., Grand Rapids, Mich.

Peterson, Builders, Waukegan, Ill., CA Approx. **$300,000.** 68x135 ft. native stone, brick CHURCH, SOUTH MILWAUKEE, WIS. St. Mary's Catholic Church, 1304 Manitoba Ave., South Milwaukee, Wis., Thomas F. Imbs, 527 W. Main St., St. Louis, Mo., archt.

▲ **Siesel Constr. Co.**, 1514 E. Ogden Ave., **Milwaukee 2,** Wis. CA, **$2,993,000** general contract;

E. D. Wesley Co., 206 E. Lincoln Ave., **Milwaukee 7,** Wis., CA, **$322,836,** plumbing contract for Hillside Terrace HOUSING addn., MILWAUKEE, WIS. Milwaukee Housing Auth., 408 E. Wells St., **Milwaukee 2, Wis. Bids June 1. CD 6/4, under LB.**

WEST OF MISSISSIPPI

BIDS ASKED—HEAVY CONSTRUCTION

Minn., Minneapolis—CENTENNIAL HALL—BA 7/8—Regents of University of Minnesota, Admin. Bldg., C. A. Smith, purch. agt., 2 wings to Centennial Hall (Dormitory), 612 S.E. Delaware St., $700,000. Plans deposit $10. C. H. Johnston, 715 Empire Bank Bldg., St. Paul, archt. CD 3/11/54.

† **Tex., Austin**—APRON—BA 7/20—U. S. Eng., 100 W. Vickery St., Fort Worth, operational apron, incl. 108,900 sq. yds. conc. paving, Bergstrom Air Force Base. Inv. No. Eng. 41-443-54-87. $150,000-$475,-000. CD 9/11/53.

BIDS ASKED—BUILDINGS

Minn., St. Louis Park—SCHOOL—BA 7/15—**Bd. Educ.,** H. R. Enestvedt, supt., grade scool on site west of Belt Line between Hy. 7 and Minnetonka Blvd., $700,000. Bissell & Belair, 1111 Nicollet Ave., Minneapolis, archts. **CD 10/27/53.**

▲ **Tex., San Antonio**—BANK—BA 7/20—**Federal Reserve** Bank of Dallas, 127 Navarro St., 2 bsmnts., 87,649 sq. ft. solid masonry finished with polished Austin cut stone Federal Reserve Bank Bldg., $2,250,-000. Plans deposit $100. Phelps & DeWees & Simmons, 342 W. Woodlawn St., archts. Frank Drought, 342 W. Woodlawn St., Gerard M. Baker, Whitby Rd., Beretta, Greenslade, Clark & Collins, Inc., Travis, Bldg., San Antonio, consult. engrs. CD 10/22/52.

▲ **Tex., Orange**—PLANT—Bids Asked—Allied Chemical & Dye Corp., Nitrogen Div., Orange, petrochemical plant expansion. $2,750,000. CD 6/18.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

MINNESOTA—State Hy. Dpt., 1246 University Ave., St. Paul,

O. B. Ashbach & Sons, 2975 Hamline Ave., N., St. Paul, Minn. CA, **$798,760.** grade, concrete pavement, concrete base, grav. base, plant-mixed bit. surf. 6.3 mi. Columbia Heights, Anoka Co. CD 6/14, under LB.

Komatz Constr. Co., St. Peter, Minn. CA, **$131,611.** grade, grav. base, plant-mixed bit. surf. 1.2 mi. in Glenwood, Pope Co. Bids May 21. CD 5/6.

Weldon Bros., Iowa Falls, Ia., CA, **$277,450,** sewage plant, ALGONA, IA. City, City Hall, Algona, Ia. Bids June 1. CD 5/13.

Carrothers Constr. Co., Inc., Paola, Kan. LB, **$938,790;** Alt. A, **$927,172;** sewage treatment plant, DES MOINES, IA. City Council, Des Moines, Ia. Bids June 3. CD 5/18.

† **MacDonald Constr. Co.**, 1310 S. Grand Blvd., St. Louis 4, Mo. CA, **$154,573.** est. $150,000. on cast iron pipe, underground gas distr. sys. lines wrapped with cathodic protection installed in place move regulators from bsmnt. to second floor in 10 bldgs., St. Louis Ordnance Plant, 4300 Goodfellow Blvd., Eng. 23-028-54-169, ST. LOUIS, MO. U. S. Eng., 601 Davidson Bldg., Kansas City, 8, Mo. CD 6/17, under LB.

▲† **Tecon Corp.**, 1201 Main St., Dallas, Tex: CA **$2,951,036.** taxiway, apron and airfield facilities, Sedalia Air Force Base, Inv. 23-028-54-56, SEDALIA, MO. U. S. Eng., 601 Davidson Bldg., Kansas City 8, Mo. CD 4/30, under LB.

† **Westinghouse Electric**, 117 N. 13 St., **Omaha, Neb.,** LB, **$127,538,** switchyard and transformer yard structures, Gavins Point Reservoir Proj., near Yankton, Inv. 25-066-54-166. SOUTH DAKOTA. U. S. Eng., 1709 Jackson St., Omaha, Neb. Bids June 15. CD 6/8.

Western Eng. Co., 4360 Nicholas St., Omaha, Neb. LB, **$118,842,** repairs to new Benson sewer, OMAHA, NEB. City, City Hall, 18 and Farnam Sts., Omaha, Neb. Bids June 15. CD 6/8.

TEXAS—State Hy. Comn., Austin,

Campbell & Kay, P.O. Box 836, Tyler, Tex., LB **$75,694.** 0.967 mi. seven structures and approaches Hy. ST 63, Proj. C 244-1-14, Angelina Co.;

Cooper & Woodruff, 222 Mays Bldg., Amarillo, Tex., LB, **$90,548.** 0.684 mi. Long Dry Creek Bridge and approach. Hy. US 66 and FM 1547, Proj. FI 547 (16), etc., Wheeler Co.;

T. W. Hansen, D. N. Anderson and James W. Dunn, P.O. Box 618, El Paso, Tex., LB, **$292,070,** 0.169 mi. Main St. viaduct extens., Hy. US 80, Proj. UGI 991 (1). El Paso Co. Bids June 15. CD 6/1, 5/21.

▲ **TEXAS**—State Hy. Comn., Austin.

Austin Bridge Co. and Austin Contrg. Co., P.O. Box 1590, Dallas, Tex., LB, **$151,164,** grading, structures, base, surf. 5.951 mi. Hy. FM 1461, Proj. S 1985 (1); Collin Co.

Austin Contrg. Co., P.O. Box 1590, Dallas, Tex., LB, **$103,336,** grading, structures, base, surf. 6.499 mi. Hy. FM 1655, Proj. S 1538 (2), Wise Co.;

Brown & Root, Inc., P.O. Box 3, Houston, Tex., LB, **$68,179,** grading, structures, flexible base, two course surf. tr. 0.936 mi. Hy. US 281, Proj. C 251-8-7, etc., Burnet Co.;

R. B. Butler Inc. and J. H. Howard, P. O. Box 471, Bryan, Tex., LB **$72,225,** grading, structures, base, surf 4.062 mi. Hy. FM 449, Proj. R 640-6-3. Harrison Co.;

Collins Constr. Co. of Texas, P.O. Box 1192, Austin, Tex., LB, **$172,568,** grading structures, base, surf. 5.302 mi. Hy. FM 2214, Proj. C 1697-2-1, Eastland Co.;

Continental Constr. Co. Inc., P.O. Box 88, Port Lavaca, Tex., LB, **$119,100,** grading, structures, base and surf. 4.388 mi. Hy. FM 1822, Proj. O 1756-1-2, etc. Jackson Co.;

Cooper & Woodruff, 222 Mays Bldg., Amarillo, Tex., LB, **$68,320,** grading, structures, base, surf. 0.583 mi. Hy. FM 368, Proj. C 804-1-4, Wichita Co.;

J. M. Dellinger, Inc., P.O. Box 4227, Corpus Christi, Tex., LB, **$304,147,** flexible base, two course surf. tr. 29.569 mi. Hy. FM 863, Proj. S 1490 (4), Webb Co.;

J. B. Griffin & N. B. Marr, 104 Richmond Dr. Waxahachie, Tex., LB **$170,425,** grading, structures, flexible base, b. conc. pavement 1.333 mi. Hy. US 287, Proj. F 385 (19), Ellis Co.;

Gulf Bitulithic Co., P. O. Box 2572, Houston, Tex., LB **$289,026,** grading, structures 6.754 mi. Hy. US 90, Proj. FI 1039 (6), Harris Co.;

Fred Hall & Son, Valley Mills, Tex., LB **$113,407,** grading, structures, base, surf. 10.84 mi. Hy. FM 1948, Proj. R 1831-1-1, etc., Hill Co.;

Fred Hall & Son, Valley Mills, Tex., LB **$113,407,** grading, structures, base, surf. 10.84 mi. Hy. FM 1948, Proj. R 1831-1-1, etc., Hill Co.;

Killian-Keller Co., P. O. Box 393, Fredericksburg, Tex., LB **$492,667,** grading, structures, foundation course and two course surf. tr. 8.532 mi. Hy. US 290, Proj. FI 425 (12), etc., Kimble Co.;

Ernest Loyd, P. O. Box 1120, Fort Worth, Tex., LB **$418,142,** grading, structures, flexible base, one course surf. tr. 7.832 mi. Hy. US 59, Proj. F 435 (8), Cass Co.;

Dave McCullough, P. O. Box 68, Burkeville, Tex., LB **$92,593,** grading, structures, base, surf. 5.144 mi. Hy. FM 2024, Proj. S 1944 (1), Sabine Co.;

Holland Page, P. O. Box 1181, Austin, Tex., LB **$85,521,** grading, structures, base, surf. 7.922 mi. Hy. FM 311, Proj. S 1834 (1), Comal Co.;

J. W. Perry and C. H. Livingston, 501 Insurance Bldg., San Antonio, Tex., LB **$375,492,** grading, structures, foundation course, b. conc. pavement 7.175 mi. Hy. US 59, Proj. C 27-8-35, Fort Bend Co.;

Public Constr. Co., P. O. Box 380, Denton, Tex., LB **$226,756,** widen resurf. with hot mix b. conc. pavement 7.411 mi. Hy. SH 6, Proj. C 258-9-15, McLennan Co.;

T. E. Sanderford, P. O. Box 58, Belton, Tex., LB **$75,802,** grading, structures, base, surf. 8.128 mi. Hy. FM 1715, Proj. S 1598 (1), Erath Co.;

Schwope Bros., 6633 W. Commerce St., San Antonio, Tex., LB **$197,319,** grading, structures, base, surf. 5.767 mi. Hy. FM 1008, Proj. R 952-1-4, Liberty Co.; LB **$141,822,** grading, structures, flexible base, one and two course surf. tr., curb and gutter, storm sewers 4.898 mi. Hy. SH 61, FM 564, Proj. C 242-3-17 and R 242-5-3, Chambers Co.;

Henry Stafford, P. O. Box 1047, Lubbock, Tex., LB **$71,944,** grading, structures, base, surf. 11.075 mi. Hy. FM 2055 and 2056, Proj. C 1865-2-1 and C 583-9-1, Gaines Co.;

Strain & Brown, Inc., P. O. Box 1057, San Antonio, Tex. LB **$187,743.** grading, structures, flexible base, b. conc. pavement 9.714 mi. Hy. US 67, Sh 51, etc. Proj. C 76-6-11, etc., Upton Co.;

Texas Bitulithic Co., P. O. Box 10365, Dallas, Tex. LB **$1,192,104,** grading, structures, storm sewers and concrete pavement 1.266 mi. Hy. US 75, Proj. UI 832 (8), Dallas Co.;

J. Carroll Weaver, P. O. Box 996, Sinton, Tex., LB **$69,131,** grading, structures, base, surf. 6.619 mi. Hy. FM 1685, Proj. S 1679 (1), Victoria Co. Bids June 15. CD 6/4, 6/1, 5/27, 5/21.

† **Burnett Constr. Co.**, Box 336, Corpus Christi, Tex., LB **$584,000.** relocate and re-erect hangar, moving from Rodd Field, Corpus Christi to Chase Field, NOY 81862. BEEVILLE, TEX. U. S. Govt., Admin. Bldg. 1, Naval Air Station, Corpus Christi, Tex. Bids June 15.

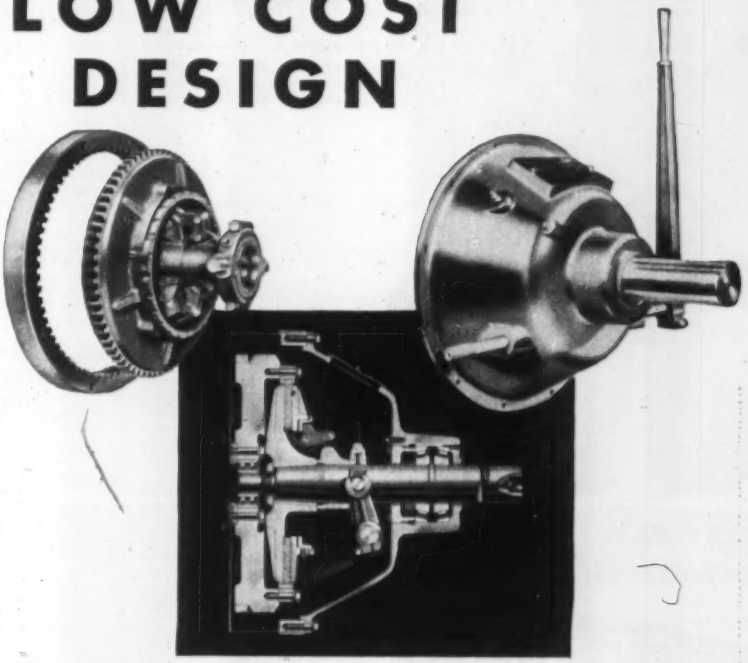
† **L. H. Lacy Co.**, 5630 Yale Blvd., Dallas, Tex., LB **$127,544.** est. $100,000-$500,000. aprons, operational and maint., Inv. No. Eng-41-243-54-86. ELLINGTON AIR FORCE BASE, TEX. U. E. Eng., Box 1229, Galveston, Tex. Bids June 15. CD 5/20.

† **MONTANA**—Bureau P. Rds., Post Office Bldg., Missoula,

Union Constr. Co., Missoula, Mont. LB, **$145,840.** grading 8.5 mi. Fortine-Olney Forest Hy., Flathead Co. Bids June 15. CD 6/3.

† **McLaughlin Inc.**, P. O. Box 1824, Great Falls, Mont. LB, **$203,775.** est. $140,164. rehabilitate 2 taxiways,

LOW COST DESIGN



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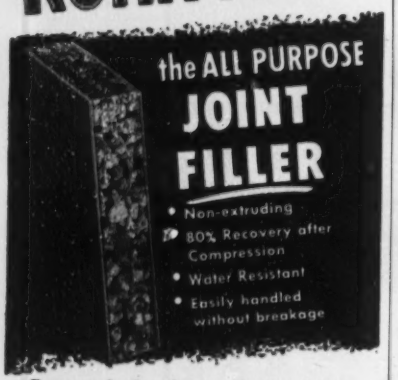

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third for Air National Guard use at Gore Field, Inv. 54-164, GREAT FALLS, MONT. U. S. Eng., 4735 E. Marginal Way, Seattle 4, Wash. Bids June 15. CD 5/28.

BUILDINGS

LOW BIDS AND CONTRACTS

Ray A. Scheperle Constr. Co., 527 Madison Ave., Jefferson City, Mo. LB, $597,887. 4 story, brick, rein.-con. state HIGHWAY BLDG. addn., JEFFERSON CITY, MO. Missouri State Hy. Comn., Rex. M. Whitton, ch. engr., State Hy. Bldg., Jefferson City, Mo. Bids June 10. CD 5/27.

Archie C. Fitzgerald, Box 101, Austin, Tex., LB, $434,280. est. $350,000. 2 story 35-room HOTEL, CONROE, TEX. Community Hotel, Inc., Conroe, Tex. Bids June 9. CD 5/18.

Centex Constr. Co., 4911 Greenville St., Dallas, Tex. CA, $515,600, Unit 7, 55 APARTMENT units: CA, $579,160, Unit 8, 60 apartment units, Eastern Oak Cliff, DALLAS, TEX. F. G. Lippitt, Sr. & Assocs., Kirby Bldg., Dallas, Tex. CD 12/10.

F. O. McMillan, Denison, Tex., Owner Builds. $340,000. 35 DWELLINGS, DENISON, TEX. CD 5/20.

Gulf Oil Corp., Gulf Bldg., Houston, Tex., Own Forces. $332,000. oil products STORAGE bldg.; $375,000. steel tank crude oil STORAGE units, FANNETT, TEX. CD 5/21.

Centex Constr. Co., 4911 Greenville St., Dallas, Tex. CA, $317,195, 33 DWELLINGS; CA, $439,180, 44 frame, brick DWELLINGS, concrete slab fdn., in addnl. sect. Freeway Manor Addn. HOUSTON, TEX. Freeway Development Co. Inc., 5519 Lawndale St., Houston, Tex.

Bertiesen Constr. Co., 2411 Bissonnet Ave., Houston, Tex., LB, $305,440. Roosevelt Elementary SCHOOL addns., Enid and Fulton Sts., HOUSTON, TEX. Houston Independent School Dist., 1300 Capitol St., Houston, Tex. H. Edw. Maddox, Jr., 3501 Buffalo Dr., Milton McGinty, 2425 Ralph St., Houston, Tex., archts. Walter P. Moore, 2 Pinedale St. and R. L. Jenkins, 4316 Blossom St., Houston, Tex. engrs. CD 11/5.

▲ **Tellepsen Petrochen Constructors**, Div. of Tellepsen Constr. Co., 1710 Telephone Rd., Houston, Tex., Design and Construct Approx. $5,000,000. 25 m. cu. ft. gas daily, gasoline PLANT, some products storage; some gas gathering and main line from Levelland and Slaughter Fields. LEHMAN, TEX. Llano Grande Corp., c/o contractor.

T. L. Evans & Sons, Pasadena, Tex., LB, $319,178, 32 DWELLINGS; LB, $371,245, 38 DWELLINGS, PASADENA, TEX. T. E. Braswell, Developer, 702 Mulberry Lane, Houston, Tex. CD 6/3.

Stahlman Constr. Corp., 4007 Greenbriar St., Houston, Tex., CA, $309,915, 38 frame DWELLINGS, concrete slab fdn., CA, $317,238, 30 frame DWELLINGS, concrete slab fdn.; CA, $353,180, 36 frame-masonry trim DWELLINGS, concrete slab fdn., Grand total $980,333. SPRING BRANCH, TEX. Stahlman Lumber Co., 4007 Greenbriar St., Houston, Tex. CD 4/27.

▲ **N. G. Petry Constr. Co.**, 1114 West 7 Ave., Denver, Colo., LB, $1,405,000, 6 story, in main bldg., 2 below grade, 100x200 ft., LIBRARY, 2 story circular North Wing with auditorium in bsmnt., remodeling 100x150 ft. GARAGE on West as one story annex, DENVER COLO. City, Library Comn., Colfax and Bannock Sts., Denver, Colo. Bids June 16. CD 5/13.

FAR WEST

BIDS ASKED—HEAVY CONSTRUCTION

† **Wash., Spokane**—FIRE STATION—BA 7/16—U. S. Eng., 4735 E. Marginal Way, Seattle, Zone 4, 9,831 sq. ft. rein.-con., masonry crash and structural fire station, Fairchild Air Force Base, Eng. 45-108-54-205. CD 6/7.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

† **Thorn & Marble**, 916 E. 64 St., Seattle, Wash., LB, $969,011, est. $1,040,907 bulk-storage facilities and hydrant refueling systems Mountain Home Air Force Base, Inv-54-20, MOUNTAIN HOME, IDAHO. U. S. Eng., City-County Airport, Walla Walla Wash. Bids June 19. CD 5/26.

▲† **Dinwidie Constr. Co.**, 210 Crocker Bldg., San Francisco, Calif., LB $1,091,323. hangar, warehouse, etc. Hubbard Air Force Base, ENG-04-203-54-415, RENO, NEV. U. S. Eng., 180 New Montgomery St., San Francisco, Calif. Bids June 15.

† **Hall-Atwater Co.**, 605 13 Ave., Seattle, Wash. CA $335,267. est. $326,783. military installation, incl. clearing, c. conc. revetment, utilities, frame bldgs., rein.-con. underground structures, Eng. 45-108-54-180, KINGSTON, WASH. U. S. Eng., 4735 E. Marginal Way, Seattle 4, Wash. Bids June 15. CD 6/3.

† **Erie City Iron Works**, Erie City, Pa. LB $108,655. 2 steam generating units and related equip. for proposed boiler plant structure at Larson Air Force Base, MOSES LAKE, WASH. Boeing Airplane Co., 7755 N. Marginal Way, Seattle 4, Wash. Bids June 14. CD 6/3.

† **Baker & Ford**, 911 17th Ave., Bellingham, Wash., CA $932,176. 181x242 ft. rein.-con. addn. to aircraft maint. hangar at Ault Field, Spec. 20849. WHIDBEY ISLAND, WASH. P. Wks. Officer, 13th Naval Dist., 1611 W. Wheeler St., Seattle, Wash. Bids May 20. CD 5/26, under LB.

▲ **CALIFORNIA**—State Div. Hys., 120 S. Spring St., Los Angeles,

Oberg Bros. Constr. Co., Box 640, Ingelwood, Calif. LB, $1,877,810 undercrossing, bridge overheads, etc., lighting, etc. Santa Ana Freeway between Lyon St. and Santa Ana-Romona Freeway Interchange, Los Angeles Co. Bids June 17. CD 5/25.

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▲ **CALIFORNIA**—State Div. Hys., 120 S. Spring St., Los Angeles,

Vido Kovacevich Co. & O. B. Pierson, 3154 N. Rosemead Blvd., Rosemead, Calif., CA, **$1,575,167**, 2.2 mi. and 2 welded steel plate grider bridges on Artesia St. between Central Ave. and Alameda St., Los Angeles Co. Bids May 27, awarded June 14. CD 6/10, under LB;

Frederickson & Watson Constr. Co., 873 81 Ave., Oakland, Calif., CA, **$1,655,392**, grading, surf. & mi. and 5 bridges between Central and Santa Clara River, Ventura Co. Bids May 27, awarded June 15. CD 6/10, under LB;

McCammon-Wunderlich Co., P. O. Box 359, Palo Alto, Calif., CA, **$2,210,215**, grading, surf. 2.8 mi. between Punta Gorda and Santa Barbara-Ventura Co. Line Ventura and Santa Barbara Counties. Bids June 3, awarded June 17. CD 6/10, under LB. Grand total $5,440,774.

CALIFORNIA—State Div. Hys., 120 S. Spring St., Los Angeles,

Ukropina-Polich-Kral & John R. Ukropina, Box 105, San Gabriel, Calif., CA, **$953,329** 4 steel girder bridges, grading, paving, etc. between Rosecrans ave. and Orange Co. line, Los Angeles Co. Bids May 27, awarded June 14. CD 6/10, under LB.

▲ **CALIFORNIA**—State Div. Hys., 120 S. Spring St., Los Angeles,

Griffith Co., 1060 S. Broadway, Los Angeles, Calif. LB, **$3,338,857**, grading, paving 3.3 mi. and bridges on Ramona Freeway between Durfee Ave. and Puente Ave., Los Angeles Co.;

Cox Bros. Constr. Co., Box 36, Stanton, Calif., LB, **$231,933**, grading, surf. 2.9 mi., rein.-con. bridge on La Habra Rd. between Grand Ave. and Imperial Hy. Orange and Los Angeles Counties;

Einer Bros. Inc. & Marsch Constr. Co., Box 202, Escondido, Calif., LB, $288,577, grading, surf., 1.6 mi. steel bridge at Lake Hodges, San Diego Co. Bids June 17. CD 5/25.

▲ **CALIFORNIA**—State Div. Hys., P. Wks. Bldg., Sacramento,

Granite Constr. Co., P. O. Box 900, Watsonville, Calif., LB, **$111,851**, grading, surf. 0.7 mi., rein.-con. bridge across Tres Pinox Creek, near Hollister, San Benito Co.; LB, **$249,243**, wid'n., surf. 1.6 mi. and wid'n. bridge, Gilroy, Santa Clara Co.;

Guy F. Atkinson Co., 10 West Orange Ave., South San Francisco, Calif., LB, **$1,321,240**, grading, paving 2.4 mi. and 4 bridges in and near Fresno, Fresno Co.;

Volpa Bros., 233 Nielsen St., Fresno, Calif., LB, **$73,617**, surf. 3.9 mi. between Flint Ave. and S. H. Rt. 10, near Hanford, Kings Co.;

A. Teichert & Son, Inc., 1931 Stocktono Blvd., Sacramento, Calif., LB, **$281,865**, wid'n., surf. 1.3 mi. Stockton Blvd. between Jansen Dr. and 14 Ave., Sacramento Co.;

Douglass & Woodhouse, P.O. Box 908, Redwood City, Calif., LB, **$78,240**, surf. 7.2 mi. Canada Rd., Woodside, San Mateo Co.;

Baker & Pollack, 211 N. Olive St., Ventura, Calif., LB, **$298,349**, wid'n., surf. between south city limits of Santa Maria and north city limits, Santa Barbara Co. Bids June 16. CD 5/25.

The Christie Co., 23 Santa Clara St., Arcadia, Calif. CA **$587,640**. sewage treatment plant pumping stations, sewer line, LAKE ARROWHEAD, CALIF. Lake Arrowhead Sanitation Dist., Court House, San Bernardino, Calif. Bids June 14. CD 5/21.

Christie Co., 23 Santa Clara St., Arcadia, Calif., CA **$135,534**, press box of steel frame and transite at race track, Santa Anita Park, LOS ANGELES, CALIF., Los Angeles Turf Club, Inc., 285 W. Huntington Dr., Arcadia, Calif., Roland E. Coate, 1445 San Marine Ave., San Marino, Calif., archt. Bids June 2, awarded June 7.

▲† **Robert E. McKee General Contractor**, 4700 San Fernando Rd., Los Angeles, Calif. CA **$2,168,576**. Group A, maintenance hangar apron and access taxiways; Group B, utilities for hangar, Eng. 04-0343-54-100, MARCH AIR FORCE BASE, CALIF. U. S. Eng., 751 S. Figueroa St., Los Angeles, Calif. William Allen, 6112 Wilshire Blvd., Los Angeles, Calif., engr.-archt. Bids June 11. CD 5/28.

Erickson-Phillips & Weisberg, 350 Market St., Concord, Calif., CA, **$998,828**, water storage reservoir, LS 630, near Hayward, OAKLAND, CALIF. East Bay Municipal Utility Dist., 512 16 St., Oakland, Calif. Bids May 28, awarded June 14. CD 6/10, under LB.

▲ **L. C. Anderson Co.**, 3040 Hancock St., San Diego, Calif., LB, **$1,062,300**, addnl. training facilities, NOY 81896, Spec. 42142, TWENTYNINE PALMS, CALIF. Dpt. Navy, San Diego, Calif. Bids June 17. CD 5/26.

BUILDINGS

LOW BIDS AND CONTRACTS

† **J. G. Watts Constr. Co.**, 4538 Macadam St., Portland, Ore., LB **$564,397**, est. $536,281, 60x300 ft. masonry, rein.-con. ammunition normal MAINTENANCE BLDG., heating plant, storehouses, b. conc. roads, railroad tract, utilities. ENG 45-164-54-26. ORDNANCE, ORE. U. S. Eng., 4735 E. Marginal Way, Seattle 4, Wash. Bids June 15. CD 5/12.

▲ **Donald M. Drake Co.**, 1600 N. W. Savier St., Portland, Ore., CA, **$1,311,936**, general constr. DENTAL SCHOOL, University of Oregon Medical School, PORTLAND, ORE. State Bd. Higher Educ., University of Oregon, Eugene, Ore., Bids June 14, awarded June 16. CD 6/18, under LB.

▲ **Guy E. Hall**, 310 E. 30 St., Bakersfield, Calif., LB, **$2,055,923**, HOSPITAL, BAKERSFIELD,CALIF. Greater Bakersfield Memorial Hospital Assn., Bakersfield, Calif. Bids June 16.

▲ **Thos. C. Bowles**, 8941 Santa Monica Blvd., Los Angeles, Calif., CA, **$1,642,500**, 225 frame, stucco DWELLINGS, Highdale, Lanalot and Bechard Sts., BELLFLOWER, CALIF. Stoll Investment Co., 8941 Santa Monica Blvd., Los Angeles, Calif.

▲ **O. L. Carpenter**, 8095 Imperial Ave., San Diego, Calif. CA **$1,867,769**. Eastern High SCHOOL, GROSSMONT, CALIF. Grossmont High School Dist., Grossmont, Calif. Bids June 11. CD 6/1.

▲ **H. B. Nicholson**, 880 Colorado St., Pasadena, Calif. LB **$1,943,000**. Brentwood Palisade Junior High SCHOOL, LOS ANGELES, CALIF. Los Angeles City School Dist., 1425 S. San Pedro St., Los Angeles, Calif. Bids June 11. CD 5/18.

Chotiner & Gumbiner Inc., 5316 Venice Blvd., Los Angeles, Calif., CA **$637,338**, 41-bed HOSPITAL, PALMDALE, CALIF. Antelope Valley Hospital Dist., Box 989, Lancaster, Calif. Bids June 2, awarded June 7. CD 5/10.

▲ **J. H. Pomeroy & Co., Inc.**, 333 Montgomery St., San Francisco, Calif., CA, **$2,000,000**, FACTORY addns., SAN FRANCISCO, CALIF. Pacific Can Co., 111 Sutter St., San Francisco, Calif. Awarded June 17.

▲ **Maino Constr. Co.**, P.O. Box 709, San Luis Obispo, Calif., CA, **$1,474,300**, general contract SCIENCE and CLASSROOM BLDGS. and site development, for California Polytechnic College, SAN LUIS OBISPO, CALIF. State Div. Architecture, 1100 S. Grand Ave., Los Angeles, Calif. Bids May 27, awarded June 17. CD 6/10, under LB.

CANADA

BIDS ASKED—HEAVY CONSTRUCTION

Ont., Wallaceburg—BA 7/6—Town, sanitary sewers and private drain connections. $100,000. C. G. Forberg, c/o owner, engr.

Ont., Ottawa—ELECTRICAL DISTRIBUTION—BA 7/7—Dpt. National Defence, ARMY, 56 Lyon St., Ottawa, electrical distr. sys.

BIDS ASKED—BUILDINGS

▲ **Man., Winnipeg**—HOUSING—BA 7/6—Central Mortgage & Housing Corp., Kensington Bldg., housing development, incl. 300 houses, semi-detached or row houses, Royal Canadian Air Force Base. $2,100,000. H. J. Petursson, c/o owner, Regional Constr. Engr. CD 11/9/53.

N. S., Halifax—GARAGE—BA 7/8—Defence Constr. Ltd., 56 Lyon St., Ottawa, Ont., combined N.E. garage and C.E. workshop, Gorsebrook, $600,000. Plans deposit $100.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

Maple Leaf Constr. Co. Ltd., 777 Erin St., Winnipeg, Man. LB **$164,000**. hard surf. city streets within business area, BRANDON, MAN. Municipality, Brandon, Man. George Durnin, Town Hall, Brandon, Man., engr.

Lakeshore Constr. Ltd., 137 Cartier St., Pointe Claire, Que., CA, **$400,000**, water mains, sewers and roads, POINTE CLAIRE, QUE. Municipality, Pointe Claire, Que. R. Labrosse, c/o owner, engr.

H. J. O'Connell Ltd., Canada Cement Bldg., Montreal, Que., CA, **$400,000**, street paving, SEPT ISLES, QUE. Municipality, City Hall, Sept Isles, Que. J. A. Boissinot, Sept Isles, engr.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **Marwell Constr. Co. Ltd.**, 1500 West Georgia St., Vancouver, B. C. Owner Builds. **$1,100,000**, 22 story 160-suite APARTMENT BLOCK, 1400 block, West Georgia St., parking, etc., VANCOUVER, B. C. Sharp & Thompson, Berwick, Pratt, 1553 Robson St., Vancouver, B. C., archts.

▲ **Twin Cities Development, Ltd.**, Banque Canadienne Nationale, Winnipeg, Man. Owner Builds. **$3,500,000**. 270 HOMES, 12-acre shopping center, Speers, Dawson and Bibeau Rds., ST BONIFACE, MAN.

Bertrand & Frere Constr. Co. Ltd., L'Orignal, Ont. CA **$475,000**. 4 story, bsmnt., rein.-con., brick HOSPITAL addn., HAWKESBURY, ONT. Sisters of Good Shepherd, Hawkesbury, Ont. Bids May 7, awarded June 15. CD 5/5.

▲ **Thomas Fuller Constr. Co. Ltd.**, 199 Richmond Rd., Ottawa, Ont., CA, **$1,300,000**, 10 story, 2 bsmnt., concrete, brick, Commonwealth OFFICE bldg., Metcalfe and Slater Sts., OTTAWA, ONT. Wittington Investments Ltd., Victoria Bldg., 140 Wellington St., Ottawa, Ont. Bids May 28. CD 5/18.

Lake Erie Resort Development Co., Port Dover, Ont. Owner Builds. est. **$450,000**. RESORT DEVELOPMENT, incl. 150 cottages, community-owned lake front park, PORT DOVER, ONT.

▲ **Wayne Building Developments Ltd.**, 2100 Bathurst St., Toronto, Ont., Owner Builds, **$1,500,000**, seven 3 story, bsmt., 50x101 ft., brick, concrete APARTMENTS, Lawrence Ave. W and Chiswick St., TORONTO, ONT.

▲ **E. G. M. Cape & Co. Ltd.**, 620 Cathcart St., Montreal, Que., CA **$3,000,000**. 5 story, bsmnt., concrete, steel, brick stone Y.M.C.A. MONTREAL, QUE. Y.M.C.A., Drummond St., Montreal, Que. Ross & Paterson, 4115 W. Sherbrooke St., Montreal, archts.

Pentagon Constr. Co. Ltd., 1225 Bishop St., Montreal, Que., CA **$400,000**. PLANT addn. on Durocher Ave., MONTREAL EAST, QUE. Noranda Mines, Ltd., Bank of Nova Scotia, Toronto, Ont.

▲ **Belleville Housing Corp.**, 1501 E. Ste. Catherine St., Montreal, Que., Owner Builds, **$2,750,000**. 215 one story, bsmnt., concrete DWELLING UNITS, ST. VINCENT DE PAUL, QUE. G. Jarry, 7271 Querbes Ave., Outremont, Que., archt.

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Turcotte Ltd., 106 Murray St., Quebec City, Que., CA, $662,000, 2 story, 200x200 ft. bsmnt., concrete, brick, stone SCHOOL, STE. FOYE, QUE. School Comn., Ste. Foye, Que. P. Warren, 38 Fabrique St., Quebec City, Que., engr. P. Rinfret, 400 Blvd., Charest, Quebec City, archt. Bids May 25. CD 5/21.

Boychuk Constr. Ltd., Saskatoon, Sask., and **Gladmer Developments**, Saskatoon, Sask. CA $630,000. 70 DWELLINGS, PRINCE ALBERT, SASK. Municipality, Prince Albert, Sask. CD 1/20.

ALASKA

HEAVY CONSTRUCTION
LOW BIDS AND CONTRACTS

† **P. N. Fackler**, Mountain View, Alaska, CA $793,269. est. $811,769, completion of water treatment plant, incl. 61x100 rapid sand filter unit wing; 17x250 ft. rein.-con. addn. to sedimentation bldg., etc. ENG-95-507-54-39. FORT RICHARDSON, ALASKA. U. S. Eng., Anchorage, Alaska. Bids June 8. CD 6/14, under LB.

Proposed Projects——

WATER SUPPLY

▲ **Ill., Litchfield**—City, City Hall, water supply, $1,200,000. Crawford, Murphy & Tilly, 755 S. Grand St. West, Springfield, Ill., consult. engrs. CD 11/16/44.

▲ **Kan., Kanssas City**—City, City Hall, concrete cover on Argentine Reservoir, $1,227,000; 6 new filters at water plant, $1,853,000; water line from Quindara plant to First and Sharon Ave., $1,853,000. Burns & McDonnell Eng. Co., 95 and Troost Sts., Kansas City, Mo., consult. engr. CD 11/24/46.

▲ **Ky., Henderson**—City, expand WW imprvs. addns., sewage treatment plant, exten. present sewer line, $3,000,000. J. Stephen Watkins, 251 E. High St., Lexington, consult. engrs. CD 12/11/46, under water supply.

▲ **[illegible], St. Cloud**—City, A. J. Haberkorn, clk., voted bonds June 7, water filtration plant, $1,000,000. R. W. Teague, city engr.

▲ **Tex., Arlington**—City, T. J. Vandergriff, mayor, 2,100-acre lake to provide adequate domestic water supply, $3,000,000. Freese & Nichols, 407 Danciger Bldg., Fort Worth, consult. engrs.

SEWERS, WASTE DISPOSAL

▲ **Calif., Salinas**—City, City Hall, voted $2,040,000 bonds, storm water drainage and sewage disposal sys. CD 4/29.

▲ **Calif., San Diego**—City, Civic Center, defeated $16,000,000 bonds, sewers. CD 5/25.

▲ **Calif., San Francisco**—City and San Francisco Co., City Hall, defeated $12,645,000 bonds, sewerage system. CD 4/7.

▲ **Calif., Vallejo**—Vallejo Sanitation & Flood Control District, City Hall, voted $6,770,000 bonds, sewage treatment plant, interceptor sewers, pumping station, outfall and trunk addns., storm drainage canal and flood control facilities. CD 2/25.

▲ **Ga., Atlanta**—City, City Hall, bond election July 14, sanitary sewer imprvs. $2,000,000.

▲ **Kan., Topeka**—City, City Hall, Subganunga Interceptor sewer, $1,500,000.

Mass., Waltham—City, Dpt. P. Wks., City Hall, sewerage along Rte. 128 from Main St. to Lexington town line, $626,870. Thomas Worcester Inc., 85 State St., Boston, consult. engr.

▲ **Minn., St. Cloud**—City, A. J. Haberkorn, clk., voted bonds, June 7, sewage treatment plant, $1,250,000. Buell & Winter, 508 Insurance Bldg., Sioux City, Ia., consult. engrs. CD 2/13/46.

▲ **Neb., Lincoln**—City, City Hall, storm sewers, $3,500,000. D. L. Erickson, city engr. CD 76/53.

▲ **Ont., Windsor**—City Council, Mayor Reaume, City Hall, replacing sewers in some section of city with larger ones and extending areas served, $8,000,000. R. K. Desmarais, City Hall, city engr. Gore & Storrie, 1130 Bay St., Toronto, Ont., consult. engrs. CD 1/27/50.

BRIDGES

▲ **MICHIGAN-ONTARIO** — International Bridge Auth., 801 Seymour St., Saulte Ste. Marie, Mich., bridge over St. Mary's River from Saulte Ste. Marie, Mich. to Saulte Ste. Marie, Ont., $20,000,000. D. B. Steinman, 117 Liberty St., New York 6, N. Y., consult. engr. CD 5/28/53.

STREETS AND ROADS

▲ **COLORADO**—State Hy. Dpt., 518 State Office Bldg., Denver,

Adams and Arapahoe Counties—grading, paving S.H. 8, Aurora-Watkins, FAP Proj. F 005-4 (5). $523,000.

Arapahoe Co.—grading, structure, stabil. and surf. S.H. 70, Englewood, FAP Proj. F 002-2 (21). $245,816.

Douglas Co.—grading, paving, structures (4-lane) S.H. 1, Castle Rock, FAP Proj. FI 002-2 (20). $130,000.

Elbert and Lincoln Counties—grading, stabil. and paving S.H. 8, River Bend and Limon, FAP Proj. FI 005-4 (4). $250,000.

El Paso Co.—grading, structure, stabil. and surf. S.H. 1, So. Colorado Springs, FAP Proj. FI 002-2 (31). $900,000.

grading, structures, pav. S.H. 115, Colorado Springs and Camp Carson, FAP Proj. FI 002-(32), $330,000.

Garfield Co.—grading, structures, paving, S.H. 4, FAP Proj. F 001-1 (10), Grand Valley east and west. $480,000.

Lincoln Co.—grading, structures, plant mix S.H. 4, Limon-Genoa, FAP Proj. FI 005-5 (3). $300,000.

Logan Co.—grading, structures, paving (4-lane). S.H. 2, Sterling, northeast. FAP Proj. FI 003-2 (1). $225,136.

Mesa Co.—grading, streets, paving, St. Hy. 20, Grand Jct.-Fruitvale, FAP F 001-1 (8). $525,000.

Morgan Co.—grading, structures, paving (4-lane) S.H. 2, FAP Proj. FI 003-1 (4). Ft. Morgan, $450,000.

Pueblo Co.—St. Hy. 18, Pueblo Ord. U. S. 50. FAP Proj. F 001-4 (2). $450,000.

grading, structure, paving S.H. 1, Pueblo, FAP Proj. FI 002-3 (12). $357,833.

grading, structure, paving, S.H. 1, Greenhorn, FAP Proj. FI 002-3 (13). $200,000.

Weld Co.—grading, structure, paving (4-lane), S.H. 3, Brighton-Ft. Lupton, FAP Proj. F 006-1 (12). $850,000. Mark U. Watrous, c/o owner, st. hy. engr.

▲ **Ga., Atlanta**—City, City Hall, bond election July 14, street imprvs. $2,000,000. CD 1/21/44.

▲ **Mich., Bay City**—City, Dpt. P Wks., $1,250,000 bond election Nov. 2, sewers, blacktopping, curb and gutter, street wid'n., paving projs. Ayres, Lewis, Norris & May, 500 Wolverine Bldg., Ann Arbor, consult. engrs. CD 5/7, under Streets and Roads. CD 5/6, under Sewers.

O., Berea—City, 47 E. Bridge St., bond election November 2, street imprvs., $600,000. Warren J. Root, 24 Beech St., city engr.

▲ **Ore., Portland**—Multnomah Co., Court House, extend Halsey, 84 to 134 Sts., imprv. Multnomah and Clackamas Sts. in area, $700,000; extend E. Burnside from Ruby Junction to Mt. Hood Hy. $300,000; widen 122 to four-lanes from N.E. Sandy to Foster Rd. $700,000; imprv. N.E. 112 from Siskiyou to Fremont, $350,000; relocate N.W. Newbury Rd. from St. Helens Rd. to Skyline Blvd., $230,000. George Buck, c/o owner, engr.

▲ **Tex., San Antonio**—City, Ralph Winton, city mgr., City Hall, bond election July 10, expressways extens. $11,000,000. CD 1/27.

† **WASHINGTON**—Bureau P. Rds., Morgan Bldg., Portland, Ore.,

Lewis Co., surf. 18 mi. of Stevens Canyon Hy. on Mt. Rainier. $563,500. CD 3/31/50.

▲ **Que., Montreal**—City, C. E. Longpre, city clk., wid'n., of Burnside Ave. between Stanley and Guy Sts., $5,500,000. L. L'Allier, city engr.

EARTHWORK, WATERWAYS

▲ **Alberta—Calgary Power Ltd., 116 Sixth Ave. W.**, Calgary, power proj. on Kenanskis River 18,500 hp earthfilled dam across river about 50 mi. south of Calgary. $3,250,000.

AIRPORTS

▲† **Ariz., Tucson**—APRON, etc.—U. S. Eng., 751 S. Figueroa St., Los Angeles, Calif., paving apron and taxiway facility, $2,000,000; Johannessen & Girand, First Natl. Bank Bldg., Phoenix, Ariz., consult. engrs. target intelligence training bldg., and base theatre $420,000. John A. Brenner & Assoc., Title & Trust Bldgs., Phoenix, Ariz., archts., both at Davis-Monthan Air Force Base. CD 12/5/52.

▲† **Calif., Muroc**—OFFICERS QUARTERS, etc.—U. S. Eng., 751 S. Figueroa St., Los Angeles, Calif., plans by Lunden, Hayward & O'Connor, 510 S. Spring St., Los Angeles, officers quarters and security control bldg., Edwards Air Force Base, $1,400,000. CD 12/10/52.

▲† **N. Y., Plattsburg**—PAVING, etc.—U. S. Eng., 80 Lafayette St., New York Zone 13, plans by Magoon & Salo, 607 Fifth Ave., New York Zone 17, paving, grading, POL facilities, railroad relocation, misc. bldgs. FY 1955, Plattsburg Air Force Base. Approx. $5,000,000. CD 10/15/52.

† **N. Y., Rome**—NAVARHO FACILITIES, RADC FACILITIES—U. S. Eng., 80 Lafayette St., New York Zone 13, plans by Wilcox & Erickson, 11 E. 44 St., New York Zone 17, NAVARHO facilities, FY 1955, $500,000-$1,000,000; plans by Greenberg & Ames, 303 Fourth Ave., New York Zone 10, RADC facilities, FY 1954, $1,000,000-$3,000,000. at Griffiss Air Force Base. CD 9/14/51.

PUBLIC BUILDINGS

▲ **Calif., Berkeley**—MUSIC—University of California, Administration Bldg., Berkeley, plans by Gardner A. Dailey, 442 Post St., San Francisco, two music buildings, $1,000,000.

Calif., Davis—GARAGE, etc.—University of California, Administration Bldg., Davis, plans by Franceschi & Mullen, 2015 J St., Sacramento, Calif., garage, storehouse and shop, $510,000.

Calif., Fort Bragg—SCHOOLS—Fort Bragg Union Elementary and Union High School Districts, 500 N. Harold St., Fort Bragg, defeated $475,000 bonds, new schools. CD 2/26.

▲ **Calif., Fresno**—SCHOOLS—Fresno City Unified School Dist., Fresno, voted $8,500,000 bonds school addns. CD 4/29.

▲ **Calif., Los Angeles**—JUVENILE HALL—City, City Hall voted $1,960,000 bonds, Juvenile Hall. CD 4/30.

▲ **Calif., Los Angeles**—CIVIC AUDITORIUM, etc.—Los Angeles Co., Hall of Records, defeated $19,500,000 bonds, for Civic Auditorium Center. CD 4/9.

▲ **Calif., Maricopa**—SCHOOL—Maricopa Unified School District, Maricopa, plans by Wright, Metcalf & Parsons, 2323 "E" St., Bakersfield, 102,800 sq. ft., school near Elkhorn, $1,200,000. CD 9/4/53.

▲ **Calif., Oakland**—SCHOOLS—Oakland City Unified School Dist., 1025 Second Ave., defeated bonds, reconstr. schools, $17,338,000; new schools, $2,500,000. CD 4/6.

▲ **Calif., Palo Alto**—SCHOOLS—Palo Alto City Unified School District, P. O. Box 450, Palo Alto, voted $5,000,000 bonds, schools $5,000,000. CD 3/25.

▲ **Calif., Pasadena** — SCHOOLS ETC. — Pasadena City High School District, 351 S. Hudson Ave. voted $6,200,000 bonds, high school imprvs.; voted $2,600,000 bonds, ofr school imprvts. CD 5/6.

▲ **Calif., Sacramento**—COUNTY OFFICES, ETC.— Sacramento Co., Court House, voted $2,500,000 bonds, office bldgs., jails, etc. CD 4/23.

Calif., Selma—SCHOOL—Selma Union High School District, Selma, defeated $734,946 bonds, new high school. CD 1/14.

Calif., Ukiah—HOSPITAL—Mendocino Co. Court House, plans by Stone & Mulloy & Marraccini & Patterson, 619 California St., San Francisco, 80-bed hospital, $900,000. CD 8/3/51.

▲ **Ga., Atlanta**—SCHOOL—City, City Hall, bond election July 14, school imprvs. $5,000,000.

▲ **Ga., Atlanta**—TRAFFIC COURT BLDG.—City, City Hall, bond election July 14, traffic court bldg. $1,000,000. CD 6/16/53.

Idaho, Rigby—SCHOOL—School Dist. 251, plans by Fetzer & Fetzer, Zion Savings Bank Bldg., Salt Lake City, Utah, 1 story rein.-con. high school, $550,000.

Ill., Joliet—SCHOOL ADDN.—Joliet Bd. of Educ., 153 S. Ottawa St., plans by J. E. Coyle, 215 Herkimer St., Joliet, 2 elementary school addns., Pershing School and Taft School $500,000. CD 9/28/51.

Ky., Lexington—GARAGE—City, garage for incinerator, $650,000, Greeley & Hansen, 220 S. State St., Chicago, Ill., consult. engrs.

▲† **Md., Camp Detrick**—LABORATORY—U. S. Eng., First and Douglas Sts. NW, Wash., D. C, plans by Vitro Corp., 962 Wayne Ave., Silver Spring, SO Div. biological laboratory. $5,000,000. CD 10/8/51.

▲ **Minn., Bloomington (P. O. Minneapolis)**—SCHOOL—Bd. Educ., A. Meir, clk., plans by Armstrong & Schlichting, 2722 Park Ave., Minneapolis, high school, $1,000,000.

Minn., St. Louis Park—CIVIC CENTER—Village, J. Justad, clk., defeated $550,000 bonds June 8, civic center comprising of several bldgs., incl. village hall. CD 5/6.

Minn., Stewartville—SCHOOL—Bd. Educ., L. Kingsley, clk., voted $900,000 bonds June 8, grade school, high school, H. H. Swanson, 500 Sexton Bldg., Minneapolis, archt. CD 5/26.

Mo., Troy—SCHOOL—Bd. Educ., School Dist. R-S of Lincoln Co., Fred Dryezehner, pres., voted $900,000 bonds, school bldgs. and addns., incl. 1 and 2 story high school, $430,000; 2 elementary schools and addns., $450,000, Ernest T. Friton, Security Bldg., St. Louis, Zone 2, archt.

N. J, Burlington—SCHOOL—Burlington Board of Educ., Burlington, plans by Micklewright & Mountford, 72 Ewing St., Trenton, N. J, new junior high school. $800,000. CD 3/16.

▲ **N. J, Pennsauken**—SCHOOLS—Bd. Educ., plans by Mayo Faint & D'Anastosio, 1915 Browning Rd., elementary school, $750,000; elementary school 42 St., $750,000, Salvatore S. Guzzardi, 1606 Locust St., Phila., Pa., consult. engr. CD 11/14/51.

N. J, Trenton—APARTMENTS—City, City Hall, garden type apartments, $800,000.

▲ **N. J., Trenton**—MEDICAL CENTER—State Institutions Dpt., State House, Trenton, $25,000,000 bond election November 2, medical-dental college. CD 5/20.

▲ **New York**—SCHOOLS—Sewanhaka Bd. Educ., Central High School Dist. 2, Tulip Ave., Elmont, voted $15,500,000 bonds June 12, for Junior-Senior High School, Leonard Blvd. and Evergreen Ave., New Hyde Park, $3,500,000; Junior High School, Hempstead Turnpike, Elmont, $2,105,000; Junior-Senior High School, Dutch Broadway and Ridge Rd., Elmont, $3,730,000; Junior-Senior High School, Franklin Square, $3,718,000; Junior-Senior High School, Plainfield Ave., Floral Park, $2,112,000. Fredric P. Wiedersum, 85 W. Hawthorne St., Valley Stream, archt.

O., Parma—CITY HALL—City, City Hall, 6611 Ridge Rd., bond election November 2, city hall. $600,000. Albert R. Chabek, c/o owner, city engr. CD 11/9.

▲ **Tex., Houston**—SCHOOLS—Houston Independent School Dist., 1600 Washington St., $15,000,000 bond election July 24, schools. CD 7/23/47.

† **Va., Fort Belvoir**—BOQ BLDGS.—U. S. ENG., 1st. and Douglas Sts., N. W., Wash., D. C. plans by McGaughan & Johnson, 821 19th St., N. W. Wash., D. C., two BOQ bldgs. $500,000-$1,000,000. CD 7/17/52.

▲ **Va., Woodbridge**—ARMY INSTALLATION BLDGS. etc.—U. S. Eng., 1st and Douglas Sts., N. W. Wash., D. C., operations bldg. $1,000,000-$3,000,000; roads, walks, parking area, $50,000-$100,000; plans by McGaughan & Johnson, 821 19th St., N. W. Wash., D. C., warehouse, $50,000-$100,000; enlisted men's barracks, $200,000-$500,000 foregoing at Classified Army Installation.

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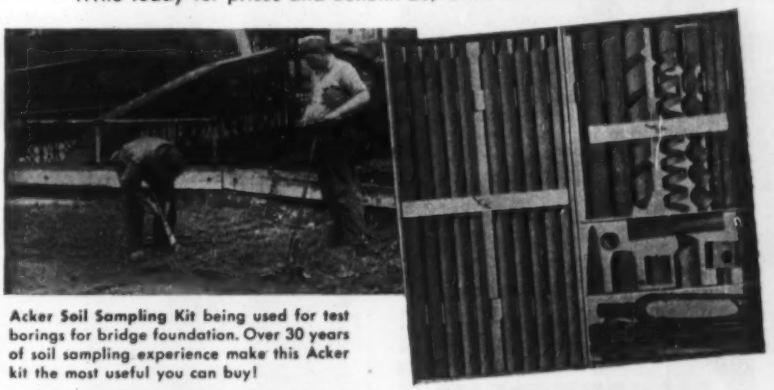

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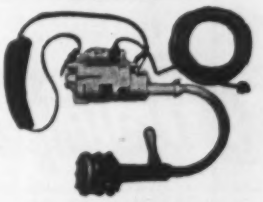

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▲ **Wash., Bellingham**—SCHOOL—School Bd., North End Junior High School, $1,000,000.

▲ **Wash., Seattle**—DORMITORY—Seattle University, Broadway and Madison Sts., plans by J. W. Maloney, Central Bldg., Seattle, Zone 4, 4 story men's dormitory, $1,000,000; 4 story faculty dormitory, $320,000. CD 6/9.

▲ **Wash., Vancouver**—SCHOOL—School Bd., plans by McCoy & Bradbury, 7007 Hy. 99-N, McLoughlin Junior High School, $1,200,000. CD 3/15.

▲ **Wis., Green Bay**—SCHOOL—Board of Educ., 523 Howe St., plans by Foeller, Schober, Berners, Safford & Jahn, 310 Pine St., Green Bay, junior high school $1,500,000. CD 2/10.

Wash., Buckley—GYMNASIUM ADDN.—School District No. 416, Buckley, plans by C. Rueger, Puget Sound National Bank Bldg., Tacoma, gymnasium addn. to school $350,000. CD 3/17.

▲ **Newfoundland, St. John's**—HOME—Roman Catholic Episcopal Corp., St. John's, plans by J. E. Hoskins, P. O. Box W-1331, St. John's, 4 story home for aged, covert wing at rear and chapel wing up front, $1,500,000. CD 12/28/51.

Ont., Port Arthur—HOME FOR THE AGED—Trustee Board, Home for the Aged, Port Arthur, plans by A. E. Angus, Whalen Bldg., Port Arthur, home for old folk, Algoma St., $750,000.

COMMERCIAL BUILDINGS

Calif., Los Angeles—ENGINEERING—Loyola University of Los Angeles, 7101 W. 80 St., Los Angeles, 1 and part 2 story, 40,000 sq. ft. masonry engineering bldg. $500,000.

Calif., Petaluma—HOSPITAL—Petaluma District Hospital, Petaluma, plans by Stone & Mulloy and Marraccini Patterson, 619 California St., San Francisco, 50-bed hospital, $850,000. CD 3/26/52.

▲ **Ind., Hammond**—SHOPPING CENTER—Mrs. Pauline Gasparovic, 6242 Columbia St., shopping center, $1,000,000. Illinana Engr. Co., 7960 Birch St., Hammond, consult. engr.

▲ **La., Lake Charles**—OFFICE—The Summit Building Co., Lake Charles, plans by Robt. L. Miller, Lake Charles, 12 story office and commercial bldg., northeast corner of State Hy. 42 and Prien Lake Rd., $2,000,000.

▲ **La., New Orleans**—HOTEL—Hotel Monteleon, Frank J. Monteleon, pres., 200 Royal St., plans by Wogan & Bernard, Pere Marquette Bldg., 9 story hotel addn., $2,000,000. CD 11/9/44.

▲ **Mass., Cambridge**—SCIENCE BLDG.—Massachusetts Institute of Technology, 77 Massachusetts Ave., physical sciences bldg., Varsar St., Edge Campus, $4,000,000; nuclear reactor and laboratory, $1,000,000. CD 1/4/49.

▲ **Minn., St. Paul**—HOUSING—J. T. Commerford, 402 Robert St., and Associate, housing proj. and shopping center on Hudson Rd. in area bounded by East Ave., Ruth and Conway Sts., $2,500,000.

Mo., St. Louis—DORMITORY—St. Louis University, Very Rev. Paul C. Reinert, prs., 221 N. Grand Blvd., Zone 3, plans by Leo A. Daly Co., 411 N. 7 St., St. Louis, Zone 1, brick, concrete, steel, girls dormitory at 3811-13 West Pine Blvd., $875,000. CD 11/19/44.

N. J., Atlantic City—MOTEL—Guliano & Ginsburg, c/o Bernard Frishman, archt., 619 Penna Ave., N. W., Wash., D. C., 90-unit motel, $500,000.

N. Y., New York—STORE, BANK—Cooper Union For the Advancement of Science and Art, 4 Ave. and 7 St., plans by R. G. Brugnoni & Rudolph C. P. Boehler, 383 Madison Ave., Zone 17, store and bank bldg. alterations, 393 Lexington Ave. and 130 E. 43 St. $800,000.

N. Y., New York—APARTMENT—Tishman Realty & Constr. Co., 445 Park Ave., Zone 22, plans by H. I. Feedman, 415 Lexington Ave., Zone 17, 6-story apartment, 405-13 E. 63 St. $500,000.

O., Cincinnati—OFFICE—Medical Arts Building Corp., c/o Wm. Geoghegan, 1st. Natl. Bank Bldg., plans by William H. Byrnes, 1659 Sutton St., doctors and dentists office at 2332 Auburn Ave. $500,000. Beineke & Ruehlmann, 628 Broadway, consult. engrs.

Pa., Bryn Mawr—APARTMENTS—Kevy K. Kaiserman, 52nd St. and Montgomery Ave., Phila., plans by J. Ethan Fieldstein. Merion Garden Apartments, Merion, four apartments, Montgomery Ave. $800,000. CD 3/8.

▲ **Pa., Norristown**—HIGH SCHOOL—R. C. Archdiocese of Phila., 310 N. 19 St., Phila., high school. $2,500,000.

▲ **Pa., Pittsburgh**—HOUSING—Town Development, Inc., Carlton House, plans by Wm. Roach, 202 Carlton House, 2 story bsmnt., 500-family brick veneer row housing development, Greentree, $5,000,000. CD 9/4.

Pa., Washington—OFFICE—Bell Telephone Co. of Pennsylvania, 416 Seventh Ave., Pittsburgh, plans by P. C. Dowler, 803 Century Bldg., Pittsburgh, 2 story bsmnt., steel, brick, block, telephone office bldg. $700,000.

▲ **Tex., Abilene**—HOSPITAL ADDN.—St. Ann's Hospital Foundation, Abilene, plans by Tucker & Linberg, 161½ Cedar St., 100-125 bed hospital addn., $1,500,000.

Tex., Galveston—SUPERMARKET, etc.—J. Weingarten, Inc., 600 Lockwood St., Houston, supermarket and shopping center, 5-acre tract, 59 St. and Broadway, $750,000.

▲ **Tex., Houston**—SHOPPING CENTER—Oscar Holcombe and Sterling Hogan, Sr., First Natl. Bank Bldg., plans by Irving R. Klein & Assocs., 1317 Austin St., shopping center, $3,500,000. Walter P. Moore, 2 Pinedale St. and Dale S. Cooper & Assocs., 420 So. Ross St., proj. engrs. CD 6/4.

▲ **Tex., Houston**—APARTMENT—Lamar Gardens Apartments, c/o O. R. Winter, 2480 Times St., plans by Joseph B. Reynolds, 2480 Times St., Garden-type apartment, brick and cedar shake exterior, 52 separate bldgs. with 336-units, etc., Danville, Buffalo Speedway, Levy Park area. $3,000,000.

Wash., Everett—CHURCH—First Baptist Church, Wetmore & Pacific Sts., plans by Durham, Anderson & Freed, 1100 Denny Way, Seattle, church, $500,000.

▲ **Wash., Kennewick**—HOUSES—Guthrie Constr. Co., N2918 Nevada St., Spokane, 150 houses, $1,500,000.

▲ **Wash., Seattle**—HOUSES—Linton Constr. Co., 411 E. 72 St., Seattle, Zone 4, 110 houses in Lynwood District north of here, $1,375,000.

▲ **Wis., Oneida**—SEMINARY—Sacred Heart Seminary, Oneida plans by Foeller, Schober, Berners, Safford & Jahn, 310 Pine St., Green Bay, seminary, incl. dormitory study hall, classrooms, dining room, kitchen, library, chapel, convent, etc. $1,000,000. CD 4/6.

▲ **Wis., Watertown**—DORMITORY, SCHOOL—Bethesda Lutheran Home, Watertown, plans by E. A. Stubenrauch & Assocs., 712 Erie Ave., 712 Erie Ave., Sheboygan, dormitory and school, $1,700,000.

Sask., Regina—APARTMENT BLOCK—Syndicate c/o Drope & Hosie, Regina, 60-suite apartment block on College Ave., $750,000.

INDUSTRIAL BUILDINGS

▲ **Ill., Chicago**—LABORATORY—Continental Can Co., 76 and Loomis Sts., plans by Schmidt, Garden & Erikson, 104 S. Michigan Ave., Chicago, Zone 3, 3 story 250,000 sq. ft., Laboratory, $2,000,000

▲ **Minn., St. Paul**—SUBSTATION—Northern States Power Co., 15 S. 15 St., Minneapolis, Merriam Park substation at Snelling and Randolph Aves., $1,300,000 (Correction-Status). CD 5/27, under CA.

▲ **Pa., Cynwyd**—PRINTING PLANT—United Lutheran Church, Bd. of Publications, 1228 Spruce St., Phila., plans by T. Norman Mansell, 262 S. 17 St., Phila., printing plant, $2,000,000

Pa., Pittsburgh—LABORATORY—Fisher Scientific Co., 711 Forbes St., plans by Marlier & Johnstone, 110 Empire Bldg., 1 story bsmnt., brick, block, steel frame laboratory, Robinson Twp. $300,000.

Tex., Houston—GARAGE—Tennessee Gas Transmission Corp., Commerce Bldg., parking garage, across McKinley Ave. $875,000.

▲ **Alta., Edson**—MILL—Frank E. Ruben, President, North Canadian Oil Co. Ltd., c/o Stadler & Hurter Co., consult. engrs., 1117 W. Ste. Catherine St., Montreal, Que., pulp and paper mill. $20,000,000.

▲ **Ont., Sarnia**—PLANT EXTENS., etc.—Polymer Corp. Ltd., S. Vidal St., Sarnia, renovation and extens. incl. 3-story office bldg. exten., conversion work for cold rubber production etc. at plant on No. 40 Hy. $3,000,000-$4,000,000. CD 9/21/50.

▲ **Ont., Toronto**—PLANT—Molson Brewery Ontario Ltd., 67 Richmond St. W., Toronto, plans by Marani & Morris, 1250 Bay St., Toronto, bottling and service plant, West Fleet St., $2,180,000. Harley, Ellington & Day, Inc., 153 E. Elizabeth St., Detroit, Mich., U.S.A., consult. engr.

▲ **Que, St. Johns**—PLANT—Cable Conduits & Fittings Ltd., St. Johns, plant, St. Louis St., $1,000,000.

▲ **Sask., Regina**—GRAIN ELEVATORS—Saskatchawan Wheat Pool, Regina, 20 grain elevators at various points. $2,000,000.

UNCLASSIFIED

▲ **Nebraska**—RURAL DISTRIBUTION LINES—Eastern Nebraska Public Power Dist., Syracuse, rural distr. lines, building facilities and sys. imprvs., Otoe Co., $1,860,000 REA allot. Henningson, Durham & Richardson, 2962 Harney St., Omaha, consult. engrs. CD 9/17/52.

† **N. J., Dover**—COAL HANDLING FACILITIES—U. S. Eng., 80 Lafayette St., New York 13, N. Y., coal handling facilities, $100,000-$500,000; steam line exten. FY 1953, $100,000-$500,000, at Picatinny Arsenal. Burns & Roe, 233 Broadway, New York 7, N. Y., consult. engrs.

Okla., Bartlesville—COUNTY FAIR BLDG.—Washington Co., Fair Bd., Bartlesville, bond election July 6, county fair bldgs. $850,000. CD 9/30.

▲ **Texas - Louisiana - Arkansas-Mississippi-Tennessee-Kentucky-Ohio-Pennsylvania and New Jersey**—PIPELINE—American Pipeline Co., 161 E. 42 St., New York, N. Y. Oil pipeline from Texas to New Jersey, $175,000,000. Engineers, Ltd., 122 E. 42 St., New York, N. Y., consult. engr.

▲ **Texas and New Mexico**—PIPE LINES—Standard Oil Co. of Texas, City Natl. Bank Bldg., Houston, Tex., 250-mi. 6 in. products line from its refinery at El Paso, Tex., to Albuquerque, N. M., 7,000 bbl. daily capacity, $4,000,000.

Tex., Laredo—UNITIZATION-PRESSURE MAINT. PROJ. Killam & Hurd, Inc., c/o Quien Sabe Co., Laredo, unitization and pressure-maint. proj. for all producing sands in Quien Sabe Field. $300,000.

▲ **Wash., Enumclaw**—PARKING LOT, ETC.—Rainier View Skyways Committee, 900 Broadway, Seattle, ski lift, parking lot, 3 story lodge and vista house in Corrall Pass, Mutton Mountain Basin, $1,500,000.

▲ **N. B., Edmundston**—RAILWAY YARDS—Canadian National R.R., R. O. Stewart, ch. engr., 360 McGill St., Montreal, Que., railway yards extensions and remodelling. $1,000,000.

Bids—Low Bids—Contracts—Second Section

NEW ENGLAND

BIDS ASKED—HEAVY CONSTRUCTION
STATE HIGHWAY LETTINGS
BRIDGES
July 7 Massachusetts
STREETS AND ROADS
July 7 Massachusetts

▲† **Me., Limestone, Perham and North Lyndon**—COMMUNICATIONS FACILITIES—BA 7/8—U. S. Eng., 857 Commonwealth Ave., Boston, Mass., communications facilities, Limestone Air Force Base, ENG.-19-016-54-121, $1,000,000-$2,000,000. Plans deposit $25, refundable, Alonzo J. Harriman, Inc., 292 Court St., Auburn, archt. CD 6/3.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **Charles Logue Building Co.,** 71 Needham St., Newton Highlands, Mass. CA Est. $900,000-$1,000,000. OUTPATIENT BLDG., Washington St., BRIGHTON, MASS. St. Elizabeth's Hospital, c/o R. C. Archdiocese of Boston, Chancery Office, 1 Lake St., Brighton, Mass. CD 2/3.

MIDDLE ATLANTIC

BIDS ASKED—HEAVY CONSTRUCTION
STATE HIGHWAY LETTINGS
BRIDGES
July 9 Pennsylvania July 13 Maryland
STREETS AND ROADS
July 6 Maryland July 9, 16 Pennsylvania
July 13 New Jersey

BIDS ASKED—BUILDINGS

▲ **Pa., Pittsburgh**—HIGH SCHOOL—BA 7/8—School Dist. of Mt. Lebanon, 735 Washington Rd., Pittsburgh, 3 story brick, block, steel frame Senior High School addn. Mt. Lebanon, $1,800,000. Ingham, Boyd & Pratt, Empire Bldg., archts. CD 8/7.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲† **Thompson Constr. Corp.,** 11 N. Pearl St., Albany, N. Y., CA $1,090,625, anti-aircraft facilities, Serial No. ENG-30-075-54-291, MODEL CITY and CAMBRIA, N. Y. U. S. Eng., 80 Lafayette St., New York 13, N. Y. Bids June 8. CD 5/21.

▲ **PENNSYLVANIA**—State Hy. & Bridge Auth., 506 North Office Bldg., Harrisburg,
Hempt Bros., Camp Hill, Pa., CA $2,087,326, constr. 3.39 mi. sect. U. S. Hy. 15, from Eichelberger's Curve in Camp Hill to the Gettysburg Interchange on the Pennsylvania Turnpike, Cumberland Co.;
J. Robert Bazley, Inc., Pottsville, Pa., CA $2,053,808, constr. 4.8 mi. sect. U. S. 122 between Shoemakersville Berks Co. and Port Clinton, Schuylkill Co. Bids June 11. CD 6/15, under LB.

▲ **NEW JERSEY**—New Jersey Turnpike Auth., Administration Bldg., New Brunswick,
Bethlehem Steel Co., 25 Broadway, New York, N. Y., LB, $2,335,972, Contract No. N-9, superstructure steelwork for viaduct in Newark, Newark Bay-Hudson County Extension, Hudson Co. Bids June 22. CD 5/19.

▲† **Humphreys & Harding,** Barr Bldg., Wash., D. C., CA, $1,584,700, consolidation of plating facilities Bldg. 41, U. S. Naval Gun Factory, WASH., D. C. Dist. P. Wks. Officer, Potomac River Naval Command, Naval Gun Factory, Wash., D. C. Bids June 16, awarded June 22. CD 6/18, under LB.

▲† **Frederick Raff Co., Inc.,** P.O. Box 899, Hartford, Conn., LB, $1,210,839, parking and site imprvs. and utilities, Dover Air Force Base, ENG-36-109-54-188, DOVER, DEL. U. S. Eng., 121 N. Broad St., Phila., Pa. Bids June 16. CD 5/7.

▲† **Williams Constr. Co., Inc.,** 145 Middle River, Baltimore, Md., LB, $2,066,968, aprons, service roads, in apron area, ENG-36-109-54189, DOVER, DEL. U. S. Eng., 121 N. Broad St., Phila., Pa., Bids June 11. CD 5/13.

▲† **J. W. Bateson Co., Inc.,** Gibralta Life Bldg., Dallas, Tex., LB, $3,310,000, operations control tower, aircraft maintenance hangar, 4 wing hangars, Dover Air Force Base, ENG-36-109-54-190, DOVER, DEL. U. S. Eng., 121 N. Broad St., Phila., 1, Pa. Bids June 10. CD 5/10.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **Neil Hellman,** 378 Clinton Ave., Albany, N. Y. Owner Builds. $1,750,000. 200-room MOTEL, Shaker Rd. and Northern Blvd., ALBANY, N. Y. Leon M. Einhorn, 93 State St., Albany, N. Y., archt.

▲ **George F. Driscoll Co. & Moccia Constr. Co.,** 41 E. 42 St., New York 17, N. Y., CA $5,465,645, general constr.;
Afgo Eng. Corp., 475 Adelphi St., Brooklyn 17, N. Y. CA $543,000, heating;
Lipsky & Rosenthal, Inc., Lexington Ave. and 115 St., New York 29, N. Y. CA $628,970, plumbing for Howard HOUSES, Proj. No. NYS 58-3, Brooklyn Boro, BROOKLYN, N. Y. New York City Housing Auth., 63 Park Row, New York 38, N. Y. Grand total $6,637,615. Bids May 11. CD 5/13, under LB. 7/1/54.

▲ **J. Rich Steers Co.,** 17 Battery Pl., New York 4, N. Y. CA, $2,410,000, general constr. Marine TRANSFER STATION, Greenpoint, BROOKLYN, N. Y. Dpt. P. Wks., Municipal Bldg., New York 7, N. Y. Bids May 26. CD 6/2, under LB.

▲ **Samuel Kosoff & Son,** 103 Janet Dr., Syracuse, N. Y. Owner Builds. $1,500,000. Northern Lights SHOPPING CENTER, 50-acre tract, Junction of Rtes. 11, 11A and 208, SYRACUSE, N. Y. S. Elmer Chambers, 433 S. Salina St., Syracuse, N. Y., archt.

▲ **Whitehall Terrace Co-operative Apartments, Inc.,** c/o Samuel Paul, archt., 89-51, 164 St., Jamaica 3, N. Y. Owner Builds. $1,000,000. two 6 story 118-families APARTMENTS, Hillside Ave. and 212 St., HOLLIS, N. Y.

▲ **Sleepy Hollow Manor Homes,** c/o Frank Zaccardo, 10 South Broadway, Tarrytown, N. Y. Owner Builds. $1,000,000. 40 HOUSES, Freemont Rd. and Hemlock Ave., NORTH TARRYTOWN, N. Y.

▲ **Forest Hill Estates,** c/o Arthur E. Williamson Co., 32 A. Kinderkamack Rd., Oradel, N. J. Owner Builds, $1,000,000. 63 HOUSES on 27-acre tract on Forest Ave. north of East Ridgewood Ave., PARAMUS, N. J.

▲ **Stewart Homes, Inc.,** c/o C. B. Snyder Realty Co., Inc., 1 Exchange Pl., Jersey City, N. J. Owner Builds, $3,000,000, 150 HOUSES on 37-acre tract on Bergen Blvd., RIDGEFIELD, N. J.

▲ **Hampshire Hills Homes,** c/o C. J. Kordys, archt., 1100 Passaic St., Passaic, N. J. Owner Builds. $1,200,000. 76 HOUSES on tract on Van Emburgh Ave., east of Route 17, RIDGEWOOD, N. J.

▲ **Bently Constr. Co., Inc.,** College Theatre Bldg., Swarthmore, Pa., Separate Contracts. $1,500,000. RESIDENTIAL DEVELOPMENT, Highland Ave., CHESTER, PA.

▲ **Shadeland Homes, Inc.,** 924 N. 46 St., Phila., Pa. Separate Contracts. $1,250,000. 100 RESIDENCES, Shadeland Ave., LANSDOWNE, PA.

▲ **Daniel J. Cronin,** 717 S. Orange St., Newark, N. J., CA $2,574,915. Harrison HOUSING DEVELOPMENT, 10 and Master Sts., PHILA., PA. Phila. Housing Auth., 42 S. 15 St., Phila., Pa. Davis, Dunlap & Carver, 2112 Spruce St., Phila., Pa., archts. William A. Gravell & Assocs., 2031 Chestnut St., Phila., Pa., engrs. Bids May 5. CD 5/14, under LB.

▲ **Bush Constr. Co., Inc.,** 2 Huntington Station, N. Y., Separate Contracts. $1,250,000. 150 RESIDENCES, Shoreham Village, SHARON HILL, PA.

▲ **S. G. Mastriani Co.,** Dunmore, Pa., CA, $1,292,142. Coughlin HIGH SCHOOL addn., alterations, WILKES-BARRE, PA. Wilkes-Barre School Dist., 81 N. Washington St., Wilkes-Barre, Pa. Lacy, Atherton & Davis, Hotel Sterling, Wilkes-Barre, Pa., archts. Quentin Bowers, Second Natl. Bank Bldg., Wilkes-Barre, Pa., engrs. Bids Apr. 30. CD 5/10, under LB.

▲ **Henry A. Knott, Inc.,** 2406 Greenmount Ave., Baltimore, Md. LB $1,419,990, est. $750,000. brick, steel, concrete block HOSPITAL bldg., BALTIMORE, MD. Maryland General Hospital Linden Ave. and Madison St., Baltimore, Md. CD 7/15.

▲† **Dean Constr Co., Inc.,** 29-28 41 Ave., Long Island City, N. Y., LB, $1,098,625. operations, shops, etc. Dover Air Force Base, ENG-36-109-54-193, DOVER, DEL. U. S. Eng., 121 N. Broad St., Phila. 1, Pa. Bids June 18. CD 5/12.

▲ **E. I. du Pont de Nemours & Co., Inc.,** DuPont Bldg., Wilmington 98, Del., Own Forces, $1,275,000. design and construct film department research LABORATORY at Experimental Station, WILMINGTON, DEL. CD 8/21/46.

SOUTH

BIDS ASKED—BUILDINGS

▲ **Fla., Gainesville**—MEDICAL SCHOOL—BA 7/27—State Bd. Control, Education Bldg., Florida State University, Tallahassee, first unit medical school, University of Florida. $5,000,000. CD 6/16/53.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ **Morrison Constructors, Inc.,** Kinder, La., CA Approx. $6,305,000, 98.7 mi. 30 in. line, Kinder to U. S. Hy. 84 to Kena, La.;
Anderson Bros. Corp., 6300 Navigation St., Houston, Tex. CA Approx. $5,850,000. 90.2 mi. 30 in. line Jena to La. side of Mississippi River;
Houston Contg. Co., 2707 Ferndale St., Houston, Tex. CA Est. $6,825,000, 105.8 mi. 30 in. line from Mississippi River to U. S. Hy. 51, near Grenada, Miss.;
Oklahoma Pipe Line Constructors, 6612 Harry Hines Blvd., Dallas, Tex., CA Est. $6,825,000, 101.6 mi. 30 in. line, Grenada to U. S. Hy. 45 near Corinth, Miss.;
Western Pipe Line Constructors, Tulsa, Okla., CA Est. $6,110,000, 94.9 mi. 30 in. line Hy. 45 to near Centerville, Tenn.;
Panama-Williams Co., Centerville, Tenn., CA Est. $4,875,000, 75.6 mi. 30 in. line, Centerville to Compressor Station No. 84, near Portland, Tenn. LOUISIANA, MISSISSIPPI, TENNESSEE. Tennessee Gas Transmission Co., Commerce Bldg., Houston, Tex. Grand Total $36,790,000. CD 1/25.

▲ **LOUISIANA**—Jointly by Parish of Jefferson and Parish of St. Tammany, State of Louisiana, Office Secy. of Jefferson Parish Jury, Court House, Gretna, Louisiana Bridge Co., Kenner, La.
(**Brown & Root Inc.,** 4100 Clinton Dr., Houston, Tex., and T. L. James, Ruston, La.) LB $30,677,210. Greater New Orleans Expressway and approaches across Lake Ponchartrain. Bids June 23. CD 5/21.

▲† **Morrison-Knudsen Co. & Blythe Brothers Co.,** 2911 Hutchinson Ave., Charlotte, 1, N. C. LB, $5,323,311, Item 1, $5,127,630 Item 2, $5,143,228 Item 3, $4,947,547 Item 4, constr. runway, NOY 81837, Spec. 42086;
McDonough Constr. Co. of Georgia, 7 Baltimore Pl. N. W., Atlanta, Ga. LB, $119,500. railroad spur, NOY 81339, Spec. 42088, Joint Air Reserve Training Center, Alvin Callender Field, Belle Chasse, NEW ORLEANS, LA. Eighth Naval Dist., Bldg. 16, Naval Station, New Orleans, La. Bids June 22. CD 5/27.

▲† **Hardaway Constr. Co.,** 15 E. 11 St., Columbus, Ga. CA, $4,200,075. reconstr. Lock No. 2 Green River 10 mi. up from Ohio River, Spottsville, KENTUCKY. U. S. Eng., 830 W. Broadway, Louisville, Ky. Bids June 17, awarded June 18. CD 6/22, under LB.

▲ **Oman Constr. Co.,** Acklen Park, Nashville, Tenn., CA $2,060,000. 13,000 ft. interceptor tunnel, NASHVILLE, TENN. City, County House-City Hall Bldg., Nashville, Tenn. CD 6/1.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **Virginia Eng. Co., Inc.,** 29 St. at James River, Newport News, Va., LB, $3,340,000. Lynchburg General HOSPITAL LYNCHBURG, VA. Lynchburg Hospital Auth., Lynchburg, Va. Bids June 8. CD 5/3.

▲ **John Tester & Son, Inc.,** 1620 Second St. S.W., Wash., D. C., CA $3,982,407, 7 story HOSPITAL, Westwood Ave., near Lamont St., RICHMOND, VA. Richmond Memorial Hospital, c/o Life Insurance Co. of Va., 914 Capitol St., Richmond, Va. Bids June 2. CD 6/4, under LB.

MIDDLE WEST

BIDS ASKED—BUILDINGS

▲ **Mich., Lansing**—SCHOOL—BA 7/12—City, Teresa V. Darling, secy., Bd. Educ., 419 N. Capitol St., 1 story Junior High School, North Side, $2,000,000. Plans deposit $50, Warren S. Holmes Co., 2200 Olds Tower, Lansing, archts. CD 10/23.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ **Ohio**—State Hy. Dpt., Columbus, Zone 15,
V. N. Holderman & Sons, Inc., 890 Oakland Park Ave., Columbus, O., LB $3,181,335, est. $3,706,300, c. conc. paving and constr. steel beam bridge with concrete deck and abutments, Br. No. GR-35-20 over B & O R.R.; continuous steel beam bridge with concrete deck and substructure, Br. No. GR-35,23 over Little Beaver Creak; continuous steel beam bridge with concrete deck and concrete abutments and piers, Br. No. GR-35-45 over Beaver Creek; continuous steel beam bridge with concrete deck and concrete substructure Br. No. GR-35-61 over Little Miami River 9.951 mi. sec. GRE-35-(0.13-9.45) U. S. R. No. 35 in Beaver Creek and Zenia Twps. and city of Zenia, Green Co. Bids June 22. CD 5/27.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **Knowlton Constr. Co.,** 106 N. Main St., Bellefontaine, O., CA $506,000. women's DORMITORY; CA $1,004,000. men's DORMITORY, BOWLING GREEN, O. Bowling Green State University, Bowling Green, O. Bids Mar. 23. CD 4/1, under LB.

▲ **Don M. Casto & Son,** 42 S. Fourth St., Columbus, O. Owner Builds. Approx. $3,000,000. 800x1,000 ft. SHOPPING CENTER, with 1,500-car parking space, ZANESVILLE, O. C. Melvin Frank, 43 W. Long St., Columbus, O., archt.

▲ **Manilow Constr. Co.,** 105 W. Adams St., Chicago, Ill., Own Forces, $3,420,000, 160 HOMES, HIGHLAND PARK, ILL. Stade & Cooley, 532 Busse Rd., Park Ridge, Fitch Miller & Frank, 100 E. Chicago Ave., Chicago, Zone 11, and John S. Townsend, 10513 S. Western Ave., Chicago, Ill., archts.

▲ **Darin & Armstrong, Inc.,** 2041 Fenkell St., Detroit 38, Mich. CA Est. $3,000,000. masonry food processing PLANT, BATTLE CREEK, MICH. Kellogg Co., Battle Creek, Mich.

▲ **Ira Hotchkiss Co.,** 15030 Wyoming St., Detroit 38, Mich. Owner Builds. $1,200,000. 125 frame HOMES, Lauren Lane, Stephens St., DETROIT, MICH.

▲ **Charfoos & Topper,** 21529 Barton St., St. Clair Shores, Mich. CA Est. $5,000,000. 500 single brick HOMES, ST. CLAIR SHORES, MICH. C. B Realty Co., (agent), 23500 Harper St., St. Clair Shores, Mich.

▲ **Garling Realty Co.,** 15620 Michigan Ave., Dearborn, Mich. Owner Builds. $5,000,000. 450 studio HOMES, Monroe St., TAYLOR, MICH.

WEST OF MISSISSIPPI

BIDS ASKED—HEAVY CONSTRUCTION
STATE HIGHWAY LETTINGS
STREETS AND ROADS
July 8, 9 Kansas July 23 North Dakota

BIDS ASKED—BUILDINGS

▲ **Mont., Bozeman**—RESIDENCE HALL—BA 7/12—State, Bd. Educ., Helena, 3 story, 225x350 ft. rein.-

con., brick women's residence hall at Montana State College. $1,300,000. Plans deposit $50. Cushing & Terrell, 1333 N. 27 St., Billings, archts. CD 3/31.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **Ring Constr. Corp.,** Metropolitan Life Bldg., Minneapolis, Minn. and **Tunnicliff Constr. Co.,** 3429 Miller St., Davenport, Ia., CA, est. $2,500,000-$3,000,000, 4 story, main bldg. and 4 wings, DOMINICAN HOUSE of STUDIES, on St. Rose Priory Grounds, Asbury Rd., DUBUQUE, IA. St. Pius Priory, 1909 S. Ashland Ave., Chicago, Ill. Barry & Kay, 53 W. Jackson Blvd., Chicago, Ill., archts. Bids June 15.

FAR WEST

BIDS ASKED—HEAVY CONSTRUCTION

STATE HIGHWAY LETTINGS

BRIDGES

July 14 California

STREETS AND ROADS

July 14, 15 California

▲† **Oregon**—BA 8/31—U. S. Eng., Pittock Block, Portland, navigation lock, adjacent gravity dam and fish ladder, The Dalles Dam, Wasco Co., CIVENG-35-026-54-176. $10,000,000. CD 12/23.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲† **Westinghouse Electric Corp.,** P. O. Box 868, Pittsburgh 30, Pa., CA, $2,116,252, 2 alternating current generators for Chief Joseph Dam, Bridgeport, WASHINGTON. U. S. Eng., 4735 E. Marginal Way, Seattle 4, Wash. CD 4/21, under LB.

▲ **CALIFORNIA**—State Div. Hys., P. Wks. Bldg., Sacramento.

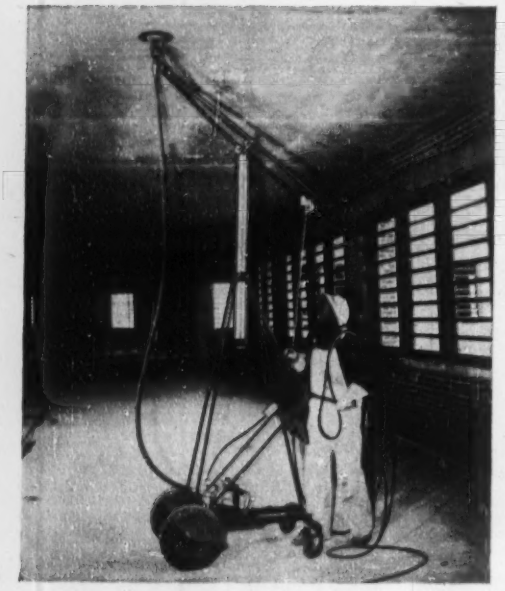
Ball & Simpson & Erickson, Phillips & Weisberg, Art Weisberg & Roscoe Phillips, Berkeley, Calif., CA, $2,670,871, grading, surf. 2.9 mi. various separation structures, etc. between Foothill Blvd. and Jct. Rt. 69, Alameda Co.;

Gordon H. Ball, San Ramon Valley Land Co., & Clements Constr. Co., Camille Ave., Danville, Calif., CA, $923,-692, grading, paving 8.4 mi. between Redmond Overhead and city limits of Tracy, Alameda and San Joaquin Counties. Bids May 26, awarded June 14. CD 6/3, under LB.

▲ **H. B. Nicholson,** 880 E. Colorado St., Pasadena, Calif., CA, $1,943,000. Brentwood-Palisades Junior High SCHOOL, LOS ANGELES, CALIF. Los Angeles City School Dist., 1425 S. San Pedro St., Los Angeles, Calif. Bids June 11. CD 6/21, under LB.

▲ **C. L. Peck,** 816 W. 5 St., Los Angeles, Calif., CA, $2,660,000, concrete SERVICE BLDG., LOS ANGELES, CALIF. Broadway-Hale Department Stores, 401 S. Broadway, Los Angeles, Calif. Bids June 2. CD 5/19.

RUBBING CEILINGS?



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300 STRAIGHT ST. PATERSON, N. J.

▲† **Bayshore Constr. Co.,** 744 Folger St., Berkeley, Calif., CA, $1,864,699, maintenance hangar, fire protection sys., etc., Mather Air Force Base Spec. 1747, ENG-54-17, SACRAMENTO, CALIF. U. S. Eng., Wright Bldg., Sacramento, Calif. Bids May 26. CD 6/3, under LB.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **Fluor Corp., Ltd.,** 2500 Atlantic St., Los Angeles, Calif., CA, Est. $12,000,000, PLANT to produce anhydrous ammonia and urea, PASCO, WASH. Columbia River Chemicals Inc., Pasco, Wash.

CANADA

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **Canadian Kellogg Co. Ltd.,** 33 Bloor St. E., Toronto, Ont., CA, $10,000,000. OIL REFINERY, DISTILLATION PLANT, CATALYTIC CRACKING UNIT, OFFICES, WAREHOUSE, TANKS, etc., ST. BONIFACE, MAN. North Star Oil Co. Ltd., Scott Bldg., Winnipeg, Man. Universal Oil Products Co., 810 S. Michigan Ave., Chicago, Ill., U.S.A., engrs. CD 12/15.

▲ **Geo. Hardy Ltd.,** 163 Wicksteed Ave., Leaside, (Toronto) Ont., CA, $2,500,000. 2 story, 300x550 ft., concrete, brick REFORMATORY on 115-acre site, 1½ mi. northwest of MILLBROOK, ONT. Ontario Dpt. P. Wks., Parliament Bldgs., Toronto, Ont. Bids May 31, awarded June 18. CD 5/14.

ALASKA

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲† **S. S. Mullen, Inc.,** 621 9th Ave. N., Seattle, Wash. CA $1,251,920, est. $1,650,333, 54,400 sq. ft. steel frame, multi-purpose docks, Edison Air Force Base, ENG-95-507-54-65, ALASKA. U. S. Eng., 4735 E. Marginal Way, Seattle 4, Wash. Bids June 15. CD 6/18, under LB.

BUILDINGS

LOW BIDS AND CONTRACTS

▲† **Valle Sommers Constr. Co.,** 407 Third Ave. W., Seattle, Wash., LB $1,111,765, two elementary SCHOOLS, Elmendorf Air Force Base, ALASKA. U.S. Housing & Home Finance Agency, New World Life Bldg., Seattle 4, Wash. Bids June 17. CD 6/11.

LATIN AMERICA

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲† **Vanguard Constr. Corp.,** 369 Lexington Ave., New York 17, N. Y., CA $1,648,700, 50-bed HOSPITAL, Kindley Air Force Base, ENG-30-347-54-9, BERMUDA. U. S. Eng., 346 Broadway, New York 13, N. Y. Bids Apr. 27. CD 2/26.

AMERICANS ABROAD

BIDS ASKED—HEAVY CONSTRUCTION

▲ Bids are being taken on the following projects under recently announced international competitive bidder of NATO.

ITALY

Ministero Difesa-Marina, Direzone Generale de Genio Militare per la Marina, Via Flaminia, Rome:
Underground shops, LaSpezia, $546,000.
Underground power station, LaSpezia, $638,000.
Heating plant and pipe line for underground petroleum storage, Cagliari, $800,000.

FRANCE

Secretariat d' Etat aux Forces Armees Air-Service de L'Infrastructure, 24 Blvd. Victor, Paris, Xveme;
3 maintenance aprons and 3 dispersal area, with 48 hardstands at Peronne, $1,680,000.
Airfield fuel installation, Colmar, $280,000.
Strengthening shoulders at Marville Airfield, $593,-600. Communicate with owners by July 9.

NETHERLANDS

Chef Verbindingsdienst Koninklijke Luchtmacht, 118, Stadhouderslann, The Hague;
Miscellaneous work at eight airfields, $512,000.

DENMARK

Soarnets Bygningedistrikt, Holmen, Copenhagen:
Breakwater, quay walls, shelters, dredging and filling at Frederickshaven. $3 million. Communicate with owner before July 22.
Interested bidders should provide information on their previous operations and experience, especially on comparable work for agencies of the U.S., to the respective foreign procurement offices, with copies to the Commercial Intelligence Division, Dpt. of Commerce, Wash. 25, D. C. This will permit the prompt certification of interested firms to the respective foreign procurement offices.

A brochure describing the international competitive bidding program for NATO infrastructure projects may be obtained on request from the Dpt. of Commerce in Washington or at any Commerce Field Office.

(Proposal Advertisements see pp. 72 to 76)

Lump sum items win San Antonio Dam, Cal.

The $3,385,434 contract for completion of the San Antonio Flood Control Reservoir in San Bernardino and Los Angeles Counties in California's Santa Ana River Basin went to Winston Bros. Co., Monrovia, Cal., for 3% less than the government estimate of $3,490,164 and 2.9% under second low bid. Six bids of the 14 submitted were joint ventures. Colvin S. Maxwell of the Los Angeles District Corps of Engineers is project engineer.

To be constructed are earth fill dam embankment, spillway, and outlet works. The dam will be 160 ft above the stream bed; its length at crest 3,850 ft. Crest length of the spillway will be 200 ft. Peak inflow will be 19,000 cu ft per second; peak outflow 8,000 cu ft per second. An earlier phase of San Antonio Reservoir was completed last year to drain 26.7 square miles. Total cost of the dam and reservoir project is $8,351,000.

The $129,000 difference between the two low bidders on lump sum items cost second bidder the contract since total difference between them was $99,362. Winston Bros. Co. bid $64,000 and 68% under second bid on clearing and grubbing; $40,000 and 57% lower to remove existing structures and obstructions. The winning contractor was lower on 17 of 18 lump sums bid.

Biggest dollar gap between the two low bidders on unit price items occurred when second low bidder went 3% and $55,000 under first for wall concrete. Largest percentage difference between them, all items included, occurred when low bidder's price for 1½" perforated plastic pipe dropped 68% below second bidder's.

Work must be completed by March 1, 1956. Minimum wage scales for the area include: carpenters $2.70-$2.78 per hour; pile drivers $2.88; cement finishers $2.70-$2.82; drillers $2.34; sewer pipe layers $2.36; painters $2.60-$3.10; power equipment operators $2.35-$3.06; operators and tenders of pneumatic and electric tools, vibrating machines, and similar mechanical tools $2.26; general laborers $2.05.

A railroad serves the area adjacent to the work site.

The government is furnishing two anchors, 24 Carlson earth pressure gages, eight Los Angeles type fluid pressure gages, and all cable required for connecting gages to terminal boxes. All other material is furnished by the contractor.

Bidders include:

1C	Winston Bros. Co., Monrovia, Cal.	$3,385,434
2	A. Teichert & Son, Inc. and Bressi & Bevanda Constructors Inc., Baldwin Park, California	3,484,798
14	Stolte Inc., Fred J. Early, Jr. Co., Inc. and John Delphia, Patterson, Cal	4,817,340
EE	US Corps of Engineers, Los Angeles 17, Cal. (without profit)	3,490,164

Bids: 2-19-54 Item	Unit	Quantity	Unit Prices 1 C	2
Rem exist structs & obstructions	ls	—	$30,000	$70,000
Clear & grub	ls	—	30,000	94,000
Stripping	cy	125,000	0.30	0.40
Exc, fndn exploration	cy	34,000	0.30	0.25
Additional rolling	hr	200	13.00	12.00
Exc, unclassified	cy	1,038,000	0.30	0.32
imperv borrow	cy	180,000	0.30	0.20
basin	cy	4,185,000	0.30	0.29
structure	cy	1,400	4.00	5.00
access gallery	cy	7,600	1.30	0.50
Settlement monument	ea	13	30.00	50.00
Drill, explor holes	lf	400	7.00	6.50
grt hls, 1⅝": 0-30' depth	lf	3,900	2.40	2.50
30-70'	lf	2,450	3.00	3.00
drain hls, 3"	lf	1,990	4.40	4.50
Grt pipe, 2" std stl	lf	2,130	0.60	1.20
Wash & pressure test	hr	300	15.00	8.00
Pressure grt—1,000 bag	bag	1,000	4.50	4.00
1,000+	bag	1,500	3.40	2.50
Pump conn for grt-min	ea	130	6.50	6.50
Fill, impervious	cy	984,000	0.13	0.13
perv II	cy	393,000	0.05	0.07
perv III	cy	3,709,000	0.05	0.06
miscellaneous	cy	3,420	0.50	0.20
Backfill, structure	cy	2,350	1.80	3.00
channl wall	cy	19,760	0.55	0.60
Drain material	cy	490	8.00	7.00
Cobblestone blanket	cy	2,750	5.50	6.00
Filter material	cy	475	4.00	5.00
Grout chistone blanket	cy	820	12.00	10.00
Conc, mass	cy	15,600	15.40	15.00
slab, ft & cut	cy	10,330	15.40	13.00
wall	cy	4,210	38.00	25.00
access gallery	cy	1,910	27.00	25.00
utility gallery	cy	440	38.00	60.00
floatwell	cy	110	50.00	60.00
misc	cy	180	50.00	50.00
pump-placed	cy	90	30.00	40.00
Portland cement	bbl	44,500	3.50	3.70
Reinf steel	lb	1,703,000	0.09	0.10
Rubber water stops, 6"	lf	1,320	1.30	2.00
9"	lf	2,790	2.20	3.00
Trowel asb asph, ¼"	sf	8,640	0.15	0.15
½"	sf	1,900	0.30	0.20
¾"	sf	1,600	0.45	0.25
Galv iron pipe, 1½"	lf	1,720	0.80	2.00
Perf plastic pipe, 1½"	lf	2,080	0.80	2.50
Drain assembly, 3½"	ea	20	30.00	30.00
Stl pipe, 8" std blk	lf	114	6.00	6.00
VCP, 6" perf	lf	2,020	1.65	1.50
8" perf	lf	2,340	1.80	2.00
8"	lf	110	2.00	2.00
CMP, 8"	lf	95	3.00	4.00
Stl P, 10" 14 ga, dip & wrap	lf	258	6.00	6.00
12" blk in conc	lf	460	15.00	14.00
18" blk in conc	lf	75	12.00	20.00
30" 14 ga	lf	208	7.00	9.00
RCP, 15"	lf	2,820	9.00	9.00
18"	lf	57	10.00	10.00
24"	lf	1,684	16.70	16.00
30"	lf	492	44.00	55.00
33" ES	lf	626	20.00	22.00
36" instlation	ls	—	10,000	9,000
CMP casing, 24" x 10'	ea	4	100.00	150.00
Misc metalwork	lb	5,050	0.50	0.60
Fencing	lf	2,380	0.90	1.00
Control house	ls	—	19,000	25,000
Sanitary system	ls	—	700.00	2,000
Oil pressure system	ls	—	14,000	25,000
Selsyn gate pos ind	ls	—	5,200	6,000
Aux gnrator & control	ls	—	13,000	15,000
Electrical system	ls	—	5,400	6,000
Watr pump & pmp house	ls	—	650.00	1,000
Plant mix asph	sy	880	0.70	1.00
Guide post	ea	22	7.00	7.00
Junction meas box	ls	—	800.00	2,000
Standpipes	ls	—	2,500	5,000
Shaft	ls	—	4,500	5,000
14" stl P 12 ga, dip & wrap	lf	190	6.60	10.00
Piezometers, spillway	ls	—	300.00	500.00
Pres ga sys, spiwy	ls	—	300.00	1,000
outlt wk	ls	—	300.00	1,000
Fence, access galry & air vent intake	ls	—	350.00	500.00
Staff gages	ls	—	1,500	3,000
Derrick stone	cy	1,000	6.50	6.00
Detr & traf cntrl fac	ls	—	14,500	10,000
Drill, overburden	lf	350	5.00	4.50
Rock groin	cy	35,000	0.75	0.60

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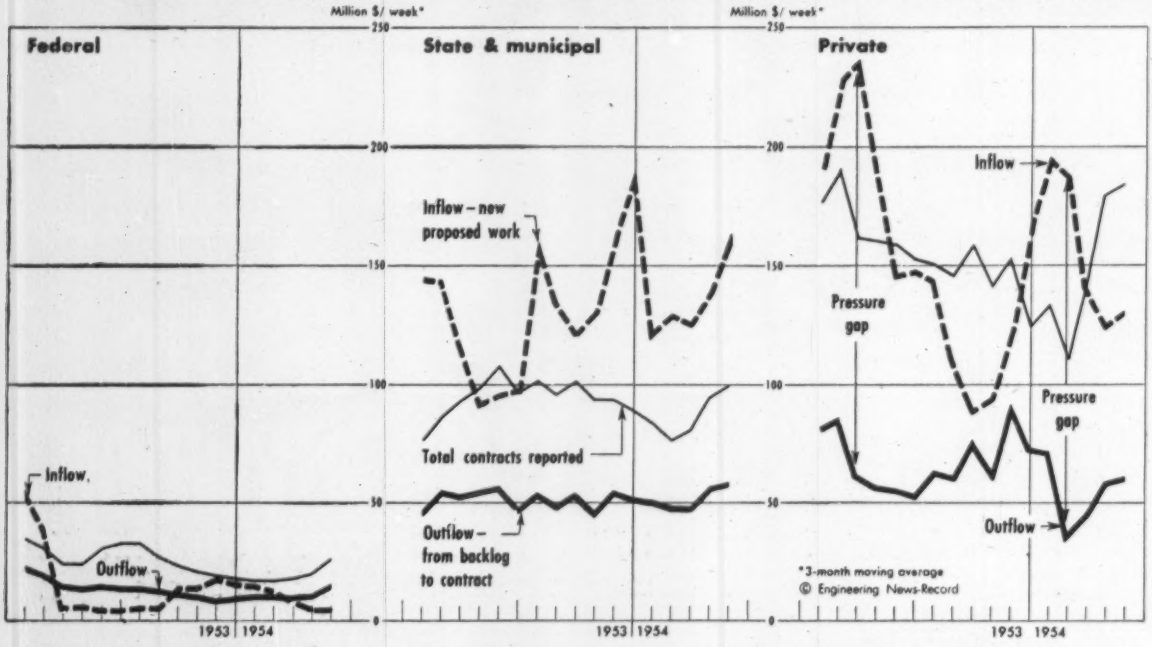
How the flow of proposed work into the backlog compares with the outflow to contracts



ENR's backlog: a solid base for the boom

Flow of proposed jobs into backlog sets new records, while proposed work is going into contracts at a faster pace

The month of June set new records in new proposed work going into ENR's backlog. The $1.6-billion total for June was the biggest ever recorded for that month, and was also the biggest for any month so far this year. This spurt of proposed work in June brought the second quarter total up to $3.9 billion, which is also a record for the April-June period. That means construction men have plenty of work ahead of them for many months to come.

Meanwhile, projects that are already in the backlog have been moving out into the contract stage at a faster rate during the second quarter than in the first three months of this year. This was particularly true of private work, which reversed the steep downward trend that had started toward the end of 1953 (see right-hand panel of chart).

The faster outflow of private projects from backlog to contract followed a rapid buildup of "pressure" in the backlog which also began in the fourth quarter of last year. In other words, the gap betwen the volume of private projects coming into the backlog and the volume going out widened very sharply in late 1953 and early 1954. After a lag, the result has been a sharp gain in volume of projects moving out.

• **Past pattern**—A somewhat similar pattern showed up in private work early in 1953, when another pressure gap developed. In that case, the inflow of private work soon dropped sharply, and the gain in volume of work flowing out of the backlog did not climb until late in the year.

During the second quarter of this year, total private awards (light line on chart) picked up even faster than volume of projects flowing out of the backlog. The reason for this is that a record volume of housing contracts was awarded in the second quarter—much of this work never is reported in the backlog because planning moves so fast.

• **Public work**—Federal projects and municipal projects also moved out of the backlog into contracts at a faster pace during the second quarter. However, the rise was much more moderate than for private work. The "pressure gap" relationship between flow into the backlog and outflow to contract means less in public work than in private construction because there is, on the average, a much longer time lag between the date public projects are proposed and the time when contracts are awarded.

The middle chart shows how volume of proposed state and municipal work climbed sharply in the quarter just ended. A big factor in this rise: the $583-million toll road proposed by the Illinois State Toll Highway Commission. Other big highway projects which went into the backlog during the past quarter include: $102 million for state roads in Florida; $91 million for a Massachusetts superhighway.

By contrast, the volume of proposed federal projects declined during the second quarter. And at the same time federal work was moving out of the backlog faster than new proposed work was coming in.

• **Private work backlog**—Early this year, the volume of new private projects going into the backlog began a sharp decline. The decline stopped in June. A very large factor in this change of trend was the proposed $175-million oil pipeline from Texas to New Jersey for the American Pipe Co.

Steel bookings are down, shipments up

While shipments of fabricated structural steel were running 4% above 1953 for the first five months of this year, bookings for future shipments were down 23%, according to the American Institute of Steel Construction as reported this week.

This drop in bookings reflects the slow start in new contracts this year for those types of heavy construction using the bulk of structurals. During the first five months of 1954, contracts reported to ENR for industrial and commercial building, bridges, airport hangars and other federal nonresidential buildings fell 36% below total volume in the similar 1953 period.

To adjust for inflation, this dollar volume is figured in terms of 1949 dollars.

If you employ current dollars, the 1954 decline in contracts is about 34%.

If you compare the trend of bookings from 1947 to 1950 with construction contracts during the same period, you will find that steel bookings generally moved with or led the trend in contracts. In other words, an upturn in bookings was accompanied by or preceded by a rise in contracts.

• **Change trend?**—Now there are signs that this relationship may be changing. ENR's contract awards may actually be leading the trend in steel bookings.

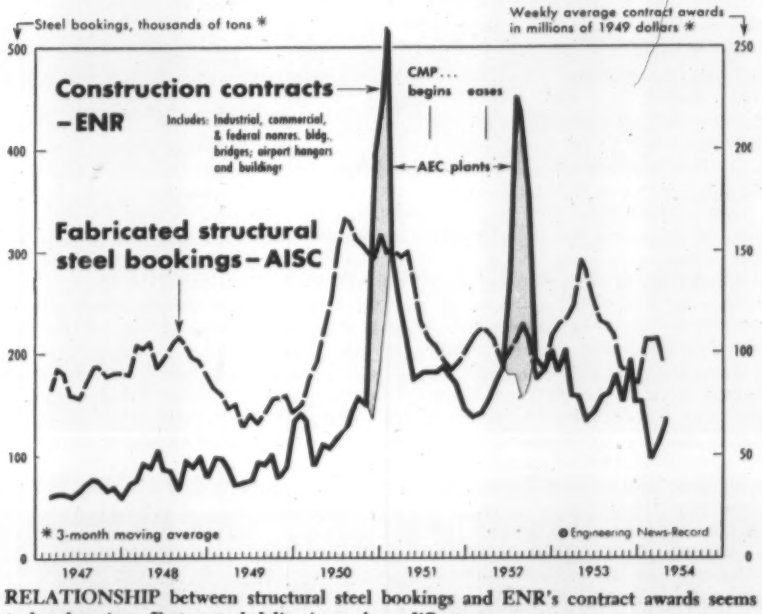
This is a possibility because deliveries of structural steel today are the fastest they have ever been in any of the years since 1949. That means there is less reason for ordering steel far in advance in order to get delivery in time to meet construction schedules.

Business briefs . . .

• **Expansions**—Penn-Texas Corp. has quired Industrial Brownhoist Corp., construction equipment manufacturer of Bay City, Mich., through an exchange of stock. Penn-Texas is a coal producer which has been diversifying lately. And Marion Power Shovel Co. has offered to acquire a controlling interest in Osgood Co., another maker of construction equipment, through an exchange of stock. Both firms are located in Marion, Ohio.

• **Mortgage terms are easing**—The Veterans Administration reports that nearly 25% of VA-guaranteed loans closed during May were made without a downpayment. Discounts on VA and FHA mortgages are easing. In some places, VAs are quoted at par value.

(*B&F continued on page 70*)



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FRB boosts banks' lending power

Its purpose is to help out the U. S. Treasury; but this may lower interest rates banks charge all borrowers

Once again, the Federal Reserve Board has moved to keep the supply of money easy. Last week, FRB lowered the requirements for the reserves which commercial banks must keep with the Federal Reserve Banks to back up their deposits. This new move will have the effect of gradually releasing about $1.5 billion of bank reserves over the next few weeks. That makes available about $7.5 billion in bank credtit to be used for loans or to buy securities.

The money situation was easy enough before FRB made its move as shown by the enthusiasm with which investors bought, in mid-June, the $300-million N. Y. Thruway revenue bond issue (ENR June 24, p. 88). The Federal Reserve is not worried about there being any lack of money to finance construction and other business needs. What it is concerned with are the money needs of the Treasury, which must raise about $10 billion by the end of the year. Much of this money will have to be borrowed from the commercial banks through the device of selling them short-term government securities. By giving the banks more lending power, FRB is easing the way for the Treasury.

• **Helps all borrowers**—This situation helps all other borrowers. There are plenty of rumors abroad that the lowering of reserve requirements will force big-city commercial banks to lower the "prime rate"—the interest they charge top-grade borrowers on short-term loans. Of course, a reduction of this rate would affect the rates that banks charge all their other borrowers.

The prime rate was lowered last March from 3¼% to 3%. Since then, the big-city banks have held the line. But the spread has been widening between the prime rate and the rate at which blue-ribbon companies have been able to borrow money in the commercial paper market. So far this year there have been six small cuts in commercial paper rates.

As of now, in the commercial paper market, a top-grade firm can sell for from 1½% to 2% notes ranging in maturity from three to six months, on an annual basis. Some sales have been made lately as low as 1⅜%.

• **Commercial paper**—This paper is bought by all sorts of investors—including corporations, country banks, local governments, insurance companies, and pension funds—which have funds they want to keep working, but want their money back very soon. Normally, most of these investors buy 91-day Treasury bills. But during the last few months the rate of interest they can get from bills has declined considerably. It is now around 0.6% (on an annual basis), compared with about 1.0% at the beginning of the year.

This competition from other short-term lenders may force down bank interest rates. That could mean slightly lower rates on construction loans to home builders and all other construction firms which borrow on short-term from banks.

Furthermore, the general easiness of short-term rates is going to be bullish for the bond market, which deals in long-term rates. Last week, a syndicate of investment bankers bid an average interest cost of 2.27% for $119 million of local public housing authority bonds, the lowest borrowing rate since January 1952. This is the tenth public sale of these bonds, which are backed by the federal government.

Revised government figures boost spending for repairs

More money is spent each year both for new construction and for maintenance and repairs than has been reported previously in government statistics. Recent revisions by the Departments of Commerce and Labor of their construction series have made small increases in the old figures for new construction and large increases in estimates for maintenance and repairs.

Revisions so far cover only parts of the series. Revised estimates are being turned out as the agencies work off the backlog of tasks resulting from last year's shakeup of the statistical services. Up to now, Commerce and Labor have recomputed spending for new construction in the three years 1951-53 and spending for maintenance and repairs during the 38-year span 1915-52.

Changes in total expenditures for new construction are relatively minor. Revised estimates increase the 1953 total by some $400 million to nearly $35.3 billion, 1952 by $370 million to $33 billion, and 1951 by about $290 million to $31.2 billion.

• **Boost in maintenance**—Much more significant are the higher estimates for maintenance and repair. For the last six years of the revised series, 1947-52, the average increase exceeds $2 billion a year.

In 1952, for example, construction maintenance and repair expenditure amounted to $14 billion, according to the new estimate. That is more than $2.6 billion higher than the old figure.

For 1952—and for other years, in general—the increase results from upward revisions of maintenance and repair outlays for housing, farm buildings, and water supply and sewage disposal systems, plus the addition of new estimates for military facilities and an "all other" classification, hitherto omitted.

On the basis of the revised estimates, total construction spending for 1952—including both new and maintenance—amounted to more than $47 billion. And if maintenance expenditures stayed at the same level last year, the total for 1953 exceeded $49 billion.

Commerce and Labor statisticians regard the revised series on construction maintenance expenditures as a significant improvement but not the final answer. The full story of the job they have done will appear—with a complete breakdown of the series—in the next issue of the Commerce Department's monthly bulletin on Construction and Building Materials.

Improvement district may finance Rockies tunnel

A Colorado highway engineer, Mark Watrous, has proposed that the state create an "improvement district" to finance the proposed Straight Creek automobile tunnel under the Continental Divide. The tunnel would cost an estimated $18 million.

Colorado's legislature passed an act last winter providing 30% of the money. The rest of the cost is supposed to be derived from tolls, which would support a revenue bond issue. However, Watrous and the State Highway Commission believe that this plan is impracticable.

Watrous suggests that the state explore the possibility of setting up an improvement district. Residents of several counties near the tunnel would be subject to an ad valorem levy on their property, in case tolls were insufficient to pay off the bonds.

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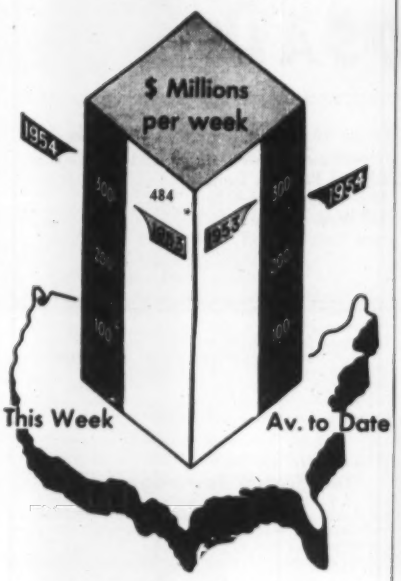
Activity This Week

As reported to ENR
(In millions of dollars)



Amount of contracts let

	This Week	Cumulative 26 wks 1954	1953	% chge
Federal	$37.2	$586.5	$807.0	−27
State and municipal	113.5	2,337.0	2,512.2	−7
Total pub.	150.7	2,923.5	3,319.2	−12
Total priv.	173.2	3,904.0	4,586.4	−15
U. S. total	**$323.9**	**$6,827.5**	**$7,905.6**	**−14**
Contracts by type of work				
Waterworks	$4.3	$115.9	$126.8	−9
Sewerage	7.5	193.9	196.9	−2
Bridges	4.6	194.3	314.3	−38
Highways	48.3	859.1	888.5	−3
Earthwork, waterways	10.6	144.8	216.1	−33
Buildings:				
Public, excl. hsg.	39.8	868.7	879.3	−1
Housg., pub.	18.7	113.2	267.8	−58
Housg., priv.	77.2	2,126.5	2,039.3	+4
Commercial	27.4	638.0	545.2	+17
Industrial	29.7	949.4	1,464.1	−35
Unclassified	55.8	623.7	967.3	−36
Total	**$323.9**	**$6,827.5**	**$7,905.6**	**−14**

NOTE: Minimum size projects included are: Waterworks and waterway projects, $34,000; other public works, $60,000; industrial buildings, $82,000; other buildings, $300,000.

New capital for construction
(millions of dollars)

	Week of June 24 1954	Cumulative 25 Wks 1954	% chge 1953-54
Corporate securities	$91.3	$1,523.0	−29
State and municipal:			
All except housing	392.3	3,019.8	+52
Housing	0.2	42.9	−80
Federal loans	5.7	63.5	+9
Federal aid	...	55.0	...
Total non-federal	**$489.5**	**$4,704.1**	**+7**
Federal approps.:			
In U. S.	...	56.0	...
Outside U. S.	...	4.6	...
Total new capital	**$489.5**	**$4,764.7**	**+9**

ENR indexes		Base years = 100 1913	1926	1949
Constr. cost	June '54	621.69*	298.85*	130.33*
	May '54	618.69	297.40	129.70
Bldg. cost	June '54	440.12	237.92	125.11
	May '54	438.69	237.14	124.70
Volume	May '54	648	263	187
	April '54	517	210	149

*Revised

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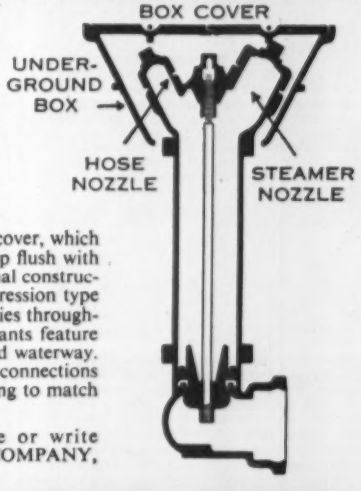

The operating nut and nozzles are accessible simply by lifting the two piece cover, which has disappearing handles designed to drop flush with the cover when not in use. Hydrant internal construction is exactly the same as M & H compression type fire hydrants used by so many municipalities throughout the country. M & H flush type hydrants feature a 5¼" valve opening and an unobstructed waterway. Can be supplied with one or two fire hose connections and/or with steamer nozzle, with threading to match existing standards.

For additional information, wire or write M & H VALVE AND FITTINGS COMPANY, ANNISTON, ALABAMA.

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OFFICIAL PROPOSALS

RATE: The rate for Official Proposal advertising is $1.80 per line or fraction set solid. Where the advertisement is set other than solid, the space is measured by total space occupied and charged on basis of 12 lines to the inch.

CLOSING DATE: Friday 10:30 A.M. for issue dated the following Thursday.

SEND COPY TO: Official Proposal Division, Engineering News-Record, 330 West 42nd Street, New York 36, N. Y.

Bids: July 15, 1954

Sludge Force Main and Pumping Station

RAHWAY VALLEY SEWERAGE AUTHORITY UNION & MIDDLESEX COUNTIES, NEW JERSEY

Contract No. 1 Sludge Force Main
Contract No. 2 Rahway River Crossing
Contract No. 3 Sludge Pumping Station

Sealed proposals for Contracts No. 1, 2, and 3 involving construction of a sludge force main and sludge pumping station for the Rahway Valley Sewerage Authority will be received at the meeting place of said Authority, the Cranford Municipal Offices, Cranford New Jersey, until eight o'clock P.M. (8:00 P.M.) Eastern Daylight Saving Time on Thursday, July 15, 1954, and at that time and place will be publicly opened and read aloud. The proposals shall be in accordance with specifications, drawings, terms of the proposed contracts, and form of bond on file with the Authority.

Contract No. 1, Sludge Force Main, involves the construction of a sludge force main approximately three miles long; Contract No. 2, Rahway River Crossing, involves construction of a subaqueous sludge pipeline approximately 500 feet in length; Contract No. 3, Sludge Pumping Station, involves the construction of a sludge pumping station complete with all piping, equipment, and appurtenances.

No bids will be received unless made in writing on forms furnished, and unless accompanied by a certified check made payable to the Rahway Valley Sewerage Authority for an amount not less than five (5) per cent of the amount of the base bid.

Bidders shall enclose as part of their sealed proposal a statement of commitment by a corporate surety company authorized to do business in New Jersey that such company will underwrite and issue to the Rahway Valley Sewerage Authority a performance bond in statutory form in behalf of the contractor.

Bidders are notified that under Chapter 180 of the Laws of 1926, State of New Jersey, they will be required to furnish a standard form of questionnaire and financial statement containing a complete statement of the bidder's ability, financial standing and experience in performing work of the type contemplated, before such bidder can be furnished plans and specifications. The Authority, through its Engineers, may refuse to furnish such bidder whose statement is unsatisfactory, with plans and specifications.

The Rahway Valley Sewerage Authority reserves the right to reject any or all bids, and to accept that one which, in its judgment, best serves its interests.

Plans and specifications may be seen at the Authority sewage treatment plant, East Hazelwood Ave., Rahway, N. J. They may be obtained at the office of the Consulting Engineer, Elson T. Killam, 529 Millburn Ave., Short Hills, N. J. upon payment of $15.00 for each set. The deposit will be returned only to Contractors submitting bona fide proposals who return the plans and specifications in good condition within ten (10) days after opening of bids.

By Order of the Rahway Valley Sewerage Authority
Charles S. Cannon, Secretary

Bids: July 14, 1954

Construction of Structures—Grading and Drainage

PENNSYLVANIA TURNPIKE COMMISSION
Harrisburg, Pennsylvania

Sealed proposals will be received by the Pennsylvania Turnpike Commission, through the Chairman, 11 North Fourth Street, Harrisburg, Pennsylvania, until 10:00 a.m., Eastern Daylight Saving Time, the 14th day of July 1954, and immediately thereafter will be taken to the Public Utility Commission's Hearing Room, No. 1 North Office Building, State Capitol, Harrisburgh, Pennsylvania, and publicly opened and read aloud for the following contract:

For the construction of structures and the grading, drainage and paving of the Turnpike Section 36-A, part of the Northeastern Extension of the Pennsylvania Turnpike in Lower Macungie, Upper Macungie and South Whitehall Townships, Lehigh County, Commonwealth of Pennsylvania, this section being situated as follows:

Beginning at a point approximately 164 lin. feet southeast of the center line of the presently existing Legislative Route 39027 at Turnpike Station 513+10 in Lower Macungie Township, Lehigh County; thence in a northwesterly direction 15,606 lin. ft. to Turnpike Station 670+00; at a point approximately 1769 lin. ft. northwest of the center line of Township Road 555 in South Whitehall Township, Lehigh County, a distance of approximately 2.96 miles.

The approximate quantities of the principal items are as follows:

Class I Excavation..	898,845 cubic yards
Class II Excavation.	26,551 cubic yards
Class 2A Excavation	5,549 cubic yards
Special Subgrade...	221,449 square yards
Reinforced Concrete Pavement	152,116 square yards
Class A concrete...	4,573 cubic yards
Class B Concrete...	6,060 cubic yards
Plain Steel Bars....	908,615 lbs.
Fabricated Structural Steel	2,049,960 lbs.
Median Divider	15,070 lin. ft.

Copies of plans, specifications and other contract documents, including cross-sections are on file and open to public inspection at the office of the Pennsylvania Turnpike Commission located at Harrisburg, Pennsylvania, not later than 30 June 1954. Plans, specifications, cross-sections and other contract documents will be available by this date for inspection or for mailing to prospective bidders. Copies of Specifications for grading, drainage, paving and structures may be purchased from the Pennsylvania Turnpike Commission for the sum of five (5) dollars per copy. Copies of cross-sections may be purchased from the Pennsylvania Turnpike Commission for the sum of fifty (50) dollars per set.

Plans and contract documents, for this section exclusive of cross-sections and specifications, may be purchased from the Pennsylvania Turnpike Commission for the sum of twenty (20) dollars for each set. No refund will be made for plans returned unless the project is withdrawn from letting by the Pennsylvania Turnpike Commission.

Remittances are payable by check or P.O. money order to the Pennsylvania Turnpike Commission and must accompany requests for drawings, specifications, contract documents, and cross-sections.

The character and amount of bid security to be furnished by the bidder is stated in the Instructions to Bidders.

The Commission reserves the right to waive any informalities in or to reject any or all bids.

No bids may be withdrawn for thirty (30) days after the scheduled closing time for receipt of bids.

PENNSYLVANIA TURNPIKE COMMISSION
James F. Torrance
Secretary and Treasurer
Harrisburg, Pennsylvania
22 June 1954

Bids: July 22, 1954

Integrated Sewerage System

FAIRFAX COUNTY, VIRGINIA

Sealed bids will be received by the Board of County Supervisors of Fairfax County, Virginia at the Office of the Sanitary Engineer, County of Fairfax, Fairfax, Virginia, until Thursday, July 22, 1954, at 2:00 o'clock, P.M. Eastern Daylight Savings Time, for the construction of:

CONTRACT NO. 21: Approximately 20,500 lineal feet of 8 and 10-inch sanitary sewers and appurtenances.

CONTRACT NO. 22: Approximately 23,700 lineal feet of 8 to 15-inch sanitary sewers and appurtenances.

CONTRACT NO. 23: Approximately 19,000 lineal feet of 8 and 10-inch sanitary sewers and appurtenances.

CONTRACT NO. 24: Approximately 35,000 lineal feet of 10 to 42-inch sanitary sewers and appurtenances.

Promptly thereafter they will be publicly opened and read in the Board of County Supervisors Room, County Office Building, Fairfax, Virginia.

Plans, specifications and contract documents may be examined and copies thereof may be obtained at the Office of the Sanitary Engineer, on or after July 1, 1954, upon payment of Ten Dollars ($10.00) per set for each contract, which amount shall not be returnable.

All bids must be on the form contained in the Contract and Specifications.

Contractors, whether resident or non-resident in Virginia will be required to show evidence of a Certificate of Registration as required by Chapter 7 of Title 54 of the Code of Virginia before their bids will be considered, if the bid is $20,000 or more.

Each bid must be accompanied by cash, or by the certified check of the bidder, made payable to the Director of Finance, County of Fairfax, Virginia, or by an acceptable bidders' bond in a amount not less than Five Percentum (5%) of the amount of the total bid. The successful bidder will be required to furnish a performance and maintenance bond in a penal sum equal to the full contract price.

No bid may be withdrawn for a period of thirty (30) days after the actual opening thereof and the right is reserved to waive any informality therein and to reject any or all bids.

COUNTY OF FAIRFAX, VIRGINIA
By: Harry L. Hale, Sanitary Engineer
Dated: June 16, 1954

U. S. Government

DEPARTMENT OF INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. DC-4197) will be received at Albuquerque, New Mex., until August 5, 1954, for furnishing labor and materials for rehabilitation of drains, Unit SW-2, Middle Rio Grande Project, New Mex. Location: Socorro and San Antonio, New Mex. Principal items are: clearing and cleaning about 44 miles of existing drains; removing existing structures; and constructing new structures, mainly 36- to 60-inch-diameter crossing culverts using asbestos-bonded CMP or precast-concrete pipe; and other work. Completion time 300 days. For particulars, address Bureau of Reclamation, Albuquerque, New Mex.; or Building 53, Denver Federal Center, Denver, Colo. W. A. Dexheimer, Commissioner.

OFFICIAL PROPOSALS

Bids: July 26, 1954

Construction of Superstructure

NEW YORK STATE BRIDGE AUTHORITY
Advertisement for Proposals
for the
Construction of the Superstructure
of the
Kingston Rhinecliff Bridge
Across the Hudson River

The New York State Bridge Authority will receive sealed proposals for the construction of Contract No. 2, Superstructure, of the Kingston Rhinecliff Bridge over the Hudson River until 2:00 P.M. Eastern Daylight Saving Time, on the 26th day of July 1954, at the Authority's office, 22 Ferry Street, Kingston, New York, at which time and place proposals will be publicly opened and read aloud.

The work includes the construction of the steel superstructure and concrete deck of a high level fixed bridge with one 36 ft. wide roadway.

The bridge consists of 2563 linear ft. of approaches having deck plate girder spans varying from 87 ft. to 150 ft. in length and 5200 linear ft. of truss spans over the river, including two simple truss spans 298.5 ft., two three-span continuous truss, (498 ft., 800 ft., 498 ft.), over the two river channels and one two-span continuous truss with 498' spans.

The principal items of work include:

	Approximate Quantities
Structural Steel, Truss Spans	24,000,000 lbs.
Structural Steel, Girder Spans	5,600,000 lbs.
Concrete, Deck	8,700 cu. yds.
Bar Reinforcement	1,800,000 lbs.

Plans, Specifications and Proposal Form for the work are on file in the office of the New York State Bridge Authority and in the Office of D. B. Steinman, Consulting Engineer, 117 Liberty Street, New York, N. Y., and may be inspected by prospective bidders during office hours.

Plans, Specifications and Proposal Forms may be obtained from D. B. Steinman, Consulting Engineer, 117 Liberty Street, New York, N. Y., upon application and payment of a fee of fifty ($50.00) dollars, no part of which will be refunded.

Bids must be made upon the proposal forms included in the Contract Documents. Each proposal must be accompanied by draft or certified check payable to the order of the New York State Bridge Authority for the sum of four hundred and fifty thousand ($450,000) dollars.

The right is reserved to reject any or all bids.

NEW YORK STATE BRIDGE AUTHORITY
Robert Hoe, Chairman

Bids: July 13, 1954

State Road Work

STATE OF NEW JERSEY
STATE HIGHWAY DEPARTMENT
TRENTON

NOTICE IS HEREBY GIVEN that sealed bids will be received by the State Highway Department for:

ROUTE 17, SECTION 9-A

Route 17, Section 9A, from New York State Line to Ramapo River, Dualization, Mahwah Township, Bergen County. Federal Project No. U-102(6). Length of project—1.123 miles. The principal items of work are:

Estimated:

Roadway Items
60,648 cu. yds. Roadway Excavation—Unclassified
48,688 cu. yds. Borrow Excavation
21,302 sq. yds. Macadam Base Course, 8" thick
16,935 sq. yds. Pavement, Type MA-BC-2, 3" thick
29,818 sq. yds. Concrete Pavement Surface, Rein. 10" thick
6,721 lin. ft. Rein. Concrete Culvert Pipe
788 lin. ft. Corrugated Metal Culvert Pipe
70—Manholes and Inlets
13,630 lin. ft. White Concrete Curb, various sizes

Bridge Items
2,662 cu. yds. Concrete in Structures
133,128 lbs. Reinforcement Steel in Structures
305,000 lbs. Structural Steel
L.S.—Lighting System Complete

Bids for the above will be received at the office of the State Highway Department, Assembly Room, Room 140, State Highway Office Building, 1035 Parkway Avenue, Trenton, N. J., on Tuesday, July 13, 1954, at ten o'clock (10:00 A. M.—EASTERN STANDARD TIME), eleven o'clock (11:00 A.M.—DAYLIGHT SAVING TIME), and will be opened and read immediately thereafter.

The receipt and opening of bids is subject to the proper qualification of the bidder in accordance with the provisions of the prequalification law and the regulations adopted by the State Highway Commissioner. Bidders must also submit a revised financial statement and statement of plan and equipment with their bid.

NOTE: The proposed project is a "Federal Aid Project" authorized by the provisions of Title 27 of the revised statutes of New Jersey and supplements, and by P. L. 413, 82nd Congress, and is to be performed in accordance with the special provisions and requirements of the Bureau of Public Roads, Department of Commerce, as outlined in the specifications, which provisions require that labor be employed from lists furnished by the State Employment Service, 43 Hudson Street, Ridgewood, New Jersey. The attention of bidders is directed to the special provisions covering subletting or assigning the contract. The minimum wage paid to all unskilled labor employed on this contract shall be $0.75 per hour. The minimum wage paid to all intermediate grade of labor employed on this contract shall be $1.00 per hour. The minimum wage paid to all skilled labor employed on this contract shall be $1.50 per hour.

Drawings, specifications and form of bid, contract and bond for the proposed work are on file in the office of the State Highway Department, Trenton, N. J., and may be inspected by prospective bidders during office hours. Plans will be furnished on a deposit of Ten Dollars ($10.00) for each set of plans upon application to A. Lee Grover, Chief Clerk, State Highway Department, Room 139, State Highway Office Building, 1035 Parkway Avenue, Trenton, N. J. Bids must be made upon the standard proposal forms in the manner designated in the standard State Highway specifications and must be enclosed in sealed special addressed envelopes bearing the name and address of the bidder and work bid upon on the outside, and must be accompanied by a certified check drawn to the order of the Treasurer of the State of New Jersey for not less than ten percent (10%) of the amount of the bid, provided that the said certified check shall not be less than $500.00 nor more than $20,000.00 and must be delivered at the above place on or before the hour named. Copies of the standard proposal forms and special addressed envelopes will be furnished on application. Bids not enclosed in sealed special addressed envelopes will be considered informal and will not be opened. The right is reserved to reject any or all bids.

Signed:
STATE HIGHWAY DEPARTMENT
A. Lee Grover, Chief Clerk

Bids: July 16, 1954

Maine Turnpike
Section 2—Portland to Augusta
(Augusta Extension)

MAINE TURNPIKE AUTHORITY

Sealed Proposals will be received by the Maine Turnpike Authority for:

CONTRACTS NO. 2221, NO. 221A and NO. 221B
PAVING

at the offices of the Authority, 17 Bishop Street, Portland, Maine until 10:00 A.M. Eastern Standard Time on July 16, 1954 at which time and place the Proposals will be publicly opened and read.

The work will be performed either (a) under a single Contract No. 221 or (b) under two separate Contracts, No. 221A and 221B. Contract No. 221A will extend from Spring Street in the Town of Scarboro near Mile 43 to north of High Street in the Town of Falmouth near Mile 51, including the South Portland Connection, Falmouth Spur and Route 100 Connection. Contract No. 221B will extend from north of High Street in the Town of Falmouth, near Mile 51 to the Androscoggin River in the City of Auburn near Mile 76.

The principal items of work for Contracts No. 221A, 221B and 221 include:

	Contract No. 221A	Contract No. 221B	Contract No. 221
Borrow, Cubic Yards	23,690	37,950	61,640
Stripping Pits, Cubic Yards	2,500	3,500	6,000
Overhaul, Cubic Yard—Miles	25,000	35,000	60,000
Reshaping and Compacting Gravel Base Course—Square Yards	744,070	1,179 550	1,923,620
Aggregate for Bituminous Macadam Base Course Tons	84,742	126,178	210,920
Asphalt Cement Gallons	880,558	1,305,858	2,186,416
Bituminous Concrete Mixture Tons	86,949	125,325	212,274
Aggregate for Bituminous Macadam Shoulders Tons	27,182	49,201	76,383
Emulsified Asphalt Gallons	466,550	844,500	1,311,050
Curbs, Walks and Dividers; Linear Feet	10,592	4,563	15,155
Steel Beam Guard Rail, Linear Feet	52,835	88,702	141,537
Wire Cable Guard Rail, Linear Feet	17,561	31,740	49,301
Topsoil and Seeding, Square Yards	977,307	1,530,306	2,507,513
Sodding, Square Yards	39,128	74,289	113,418
Preparation of Gravel Surface Course, Square Yards	26,473	59,354	85,827
Tar for Surface Treatment; Gallons	20,362	34,204	54,566
Cover Material for Surface Treatment, Tons	625	1,052	1,677

Plans and contract documents may be examined by prospective bidders during regular office hours at the offices of the Authority and at the offices of the Consulting Engineers, Howard, Needles, Tammen & Bergendoff, 55 Liberty Street, New York 5, N. Y. The plans and contract documents may be obtained from the Authority, 17 Bishop Street, Portland, Maine, upon payment of Thirty-Five Dollars ($35.00) for each set which will not be refunded. Checks shall be made payable to Howard, Needles, Tammen & Bergendoff.

Proposals must be accompanied by a certified or cashier's check payable to the Maine Turnpike Authority in an amount not less than five per cent (5%) of the Total Amount in the Proposal but not less than $500,000 nor more than $200,000.00

If a bidder submits a Proposal for Contract No. 221, as well as a Proposal for Contract No. 221A and/or Contract No. 221B, one check based on the Total Amount in the Proposal for Contract No. 221 will be sufficient.

Proposals must be made upon the Proposal forms furnished separately by the Authority with the contract documents and must be enclosed in the sealed special addressed envelopes provided therefor bearing the name and address of the bidder and the number of the Contract on the outside.

Before the award of the Contract, any bidder may be required to show that he has the necessary facilities, experience, ability and financial resources to perform the work within the time required and to the satisfaction of the Authority.

The Bidder, to whom a Contract is awarded, will be required to furnish a Surety Corporation Bond, satisfactory to the Authority, on the standard Contract Bond form of the Authority, for a sum not less than the Total Amount of the Proposal.

The Authority reserves the unqualified right to reject all Proposals or to accept that Proposal which in its sole judgment will under all circumstances serve its best interests. The Contract will be awarded or Proposals rejected within thirty days after the date of opening Proposals, except that in the event of default by a successful bidder the Authority reserves the right to accept the Proposal of any other bidder within twenty days after such default.

MAINE TURNPIKE AUTHORITY
Paul C. Thurston, Chairman

Portland, Maine
June 23, 1954

Read the Official Proposal Columns of ENGINEERING NEWS-RECORD This Week and Every Week

OFFICIAL PROPOSALS

PROCUREMENT DEPARTMENT, CITY OF PHILADELPHIA

Sealed proposals will be received in Room 313, City Hall Annex until 2:30 p.m., D.S.T. on July 23rd, 1954 and publicly opened at that time in Room 313 City Hall Annex for furnishing all labor and materials necessary to perform and complete the Bid No. 4582, Air Conditioning and Bid No. 4583, Electrical Work for the Air Conditioning of Convention Hall at 34th & Curie Ave., Phila., Pa.

Specifications, form of proposal and prequalification questionnaire may be obtained at the Department of Public Property, Office of the City Architect, 830 City Hall Annex. A deposit of $50.00 cash or certified check will be required from those taking out each copy of specifications and plans. This sum will be refunded upon return of said specifications and plans in an undamaged condition within ten days after bids are received. Notice: No bid for this work will be received unless the Qualification of Bidders Questionnaire form furnished by the Department of Public Property, properly filled out with all questions fully answered, is filed with the City Architect, 830 City Hall Annex, at least one week before the date set for opening bids, and at the same time the contractor shall furnish satisfactory proof that he is able to complete his work within the time specified. The forms of contract and bonds may be obtained at Room 715 City Hall Annex.

A. ALBERT CHERASHORE, Procurement Commissioner

Bids: July 15, 1954

Grading, Embankment, and Sewer Load Relieving Structure Contract No. P-1

DELAWARE RIVER PORT AUTHORITY

Administration Building
Camden, New Jersey

Sealed bids will be received for Grading, Embankment and Sewer Load Relieving Structure for approaches in Philadelphia, Pennsylvania to new Bridge between Packer Avenue, Philadelphia, Pennsylvania, and Gloucester, New Jersey, known as Contract No. P-1, at the office of of the Executive Director of the Delaware River Port Authority, Administration Building, Bridge Plaza, Camden, New Jersey until 2:00 P.M., (Daylight Saving Time), July 15, 1954 at which place and time they will be publicly opened and read by the Authority.

A more complete description of the work and full information for bidders are given in the Contract Documents and Specifications for this Contract, which may be obtained upon a deposit of $10.00 which will be remitted upon receipt of bid or the return in good condition of the copies so taken within thirty days after the opening of bids.

Each proposal must be accompanied by a certified check in the sum of $100,000 payable to the Delaware River Port Authority and drawn upon a National or State Bank or Trust Company having an office or place of business either in Philadelphia, Pennsylvania or Camden, New Jersey, and must not be enclosed with the sealed bid. The surety's consent must be shown. The bidder to whom the contract in awarded will be required to furnish a performance and Labor and Materialmen's Bond in the sum of 100 per cent.

The Authority will afford prospective bidders an opportunity to inspect the site of the work.

The Authority reserves the right to waive any informalities in the bids received; to reject any or all bids, and to award the contract only to those experienced in this class of work and to the bidder whose proposal is deemed by the Authority to be most advantageous to the public interest.

DELAWARE RIVER PORT AUTHORITY
JOSEPH K. COSTELLO
Executive Director

Bids: July 13, 1954

Contract 441

CLEARING AND GRUBBING PEPACTON RESERVOIR

SEALED BIDS will be received by the Board of Water Supply, at its offices, thirteenth floor, 120 Wall Street, New York City, until 10:00 A.M., Eastern Standard Time, on Tuesday, July 13, 1954, for Contract 441, for clearing and grubbing the easterly portion of the Pepacton reservoir and performing related work, in the Towns of Middletown, Andes and Colchester, Delaware county, New York. The work will comprise the clearing of approximately 700 acres, the grubbing of about 580 acres, required excavation and removal of excrementitious material and, to the extent specified, the collection and disposal of debris carried or deposited by the streams from the entire reservoir area and the cleaning of certain wooded and adjacent areas upstream of the reservoir, all as set forth in the specifications.

No bid will be received and deposited unless accompanied by a certified check upon a National or State bank, drawn and made payable to the order of the Comptroller of The City of New York, in the amount of thirty thousand dollars ($30,000.00) for the proper execution of the contract.

At the above place and time the bids will be publicly opened and read. Pamphlets containing information for bidders, forms of bid and contract, specifications, contract drawings, requirements as to surety, etc., can be obtained in Room 1316 at the above address, upon application in person or by mail, by depositing the sum of five dollars ($5.00) in cash or its equivalent for each pamphlet. Within 30 days following the award of contract or rejection of bids, the full amount of such deposit will be refunded for each pamphlet submitted as a bid and a refund of four dollars ($4.00) will be made for each other pamphlet returned in acceptable condition. For further particulars, apply at the office of the Chief Engineer at the above address.

IRVING V. A. HUIE, President, EDWARD C. MAGUIRE, HERBERT M. ROSENBERG, Commissioners, Board of Water Supply; BETTY COHEN, Acting Secretary.

Bids: July 20, 1954

Test Borings

CONTRACT 450

SEALED BIDS will be received by the Board of Water Supply, at its offices, thirteenth floor, 120 Wall Street, New York City, until 10:00 A.M., Eastern Standard Time, on Tues, July 20, 1954, for Contract 450, for making test borings in the Towns of Deposit, Tompkins, Hancock and Colchester, Delaware county, Rockland and Neversink, Sullivan county, and Wawarsing, Ulster county, New York, all as set forth in the specifications. The borings, in general, will be made on land at such places as may be directed in the vicinity of the proposed site for the dam of the Cannonsville reservoir, along the proposed tunnel from that reservoir to the existing Rondout reservoir and along the proposed bypass tunnel at Rondout reservoir. The borings in the vicinity of the Cannonsville reservoir will vary in depth from less than 50 to about 250 feet. Along the proposed tunnels the borings to determine the elevation of bed rock will vary from about 30 to 250 feet in depth and those to determine the nature and condition of the bed rock from about 200 to 900 feet.

No bid will be received and deposited unless accompanied by a certified check upon a National or State bank, drawn and made payable to the order of the Comptroller of the City of New York, in the amount of ten thousand dollars ($10,000.00) for the proper execution of the contract.

At the above place and time the bids will be publicly opened and read. Pamphlets containing information for bidders, forms of bid and contract, specifications, contract drawing, requirements as to surety, etc., can be obtained in Room 1316 at the above address, upon application in person or by mail by depositing the sum of five dollars ($5.00) in cash or its equivalent for each pamphlet. Within 30 days following the award of contract or rejection of bids, the full amount of such deposit will be refunded for each pamphlet submitted as a bid and a refund of four dollars ($4.00) will be made for each other pamphlet returned in acceptable condition. For further particulars, apply at the office of the Chief Engineer at the above address.

IRVING V. A. HUIE, President, EDWARD C. MAGUIRE, HERBERT M. ROSENBERG, Commissioners, Board of Water Supply; BETTY COHEN, Acting Secretary.

SEARCHLIGHT SECTION

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ENGINEERS
Foreign Service

Graduate Chemical, Mechanical, Electrical & Construction Engineers with minimum of 5 years' experience. For specialized assignments commensurate with qualifications in various phases of construction, estimating materials and cost control, planning and refinery process work. Write giving full particulars regarding personal history and work experience. Please include telephone number.

Recruiting Supervisor, Box 30

Arabian American Oil Company

505 Park Avenue, New York 22, N. Y.

REPLIES (Box No.): Address to office nearest you
NEW YORK: 333 W. 42nd St. (36)
CHICAGO: 520 N. Michigan Ave. (11)
SAN FRANCISCO: 68 Post St. (4)

POSITIONS VACANT

WANTED—ESTIMATOR for Plumbing, Heating, Air Conditioning & Process Piping. Must be able to do accurate take offs and have full knowledge of piping industry. Minimum of 5 years experience required. Location Central New York. Give full particulars with first reply. State education, experience, salary desired and date available. P-3115, Engineering News-Record.

ENGINEER WANTED—Organization planning established research fellowship for study of land use, conservation and rehabilitation wishes contact graduate civil engineer age 25 to 35, preferably some experience gravel economics and operation with imagination and interest in landscape engineering. Objective eventual specialized consulting association. Location Eastern States. Reply Box 3093, Engineering News-Record.

MATERIALS ENGINEERS and Inspectors experienced in concrete, bituminous paving and soils. Vacancies in several grades. Write complete details to Toledo Testing Laboratory, Toledo, Ohio.

WANTED: Instructor of Engineering Drawing and descriptive geometry. Salary up to $4,700 for 9 month period and assistant professorship for qualified person. M. E. graduate preferred. Dept. of Engr. Drawing, University of North Dakota, Grand Forks, North Dakota.

MALE HELP Wanted: Experienced Structural Draftsman. Personnel—Box 1087, Charlotte 1, N. C.

OHIO ENGINEERING firm needs engineers experienced in highway and bridge design for permanent work on urban expressway projects. Reply giving full experience record, personal history and salary desired. P-3065, Engineering News-Record.

ASSISTANT ENGINEER Civil Engineering degree and one year experience required. Salary between $4,000 & $4,500 year. Applicants answer to Stanley B. Goldberg, Town Engineer, Saugus, Mass.

GRADUATE CIVIL Engineer for Company in Brazil as Technical Assistant to Chief-planning. Age around 40, with 5 years experience in: 1) preparing and completing preliminary and basic studies and layouts of hydro-electric developments for consideration as to technical and economical feasibility, 2) analysing and evaluating hydrological, topographical and geological data with relation to power development studies, 3) determining survey work required. Position requires engineer of maturity and judgment with teaching experience and leadership ability. P-3162, Engineering News-Record.

CONSTRUCTION SUPERINTENDENT for roadways, bridges and culverts for Turnpike Project. Send reply to Lombardo Bros. Construction Company, 3600 Ridge Road, Cleveland 2, Ohio, or phone collect and ask for I. T. Priesand.

BRIDGE ENGINEERS AND SPECIFICATION WRITERS

Civil Graduates of accredited U. S. colleges. Must have not less than the following experience:

Detailers—2 years structural steel or reinforced concrete detailing.

Designers—5 years responsible work on structural steel and concrete including work on long span bridges.

Squad Leaders—3 years responsible charge of squad on structural steel detailing.

Specification Writers—With design and field experience for writing specifications for steel bridges, concrete structures, and highway construction.

Please mail complete resume together with salary required to:

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55 Liberty Street New York 5, N. Y.

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Must be experienced, ideal working conditions, Air-Conditioned Office, Employees' Benefits. Vacation with Pay — Salary Commensurate With Ability.

Housing Available—

CONSOLIDATED WESTERN STEEL
BOX 341 ORANGE, TEX.

STRUCTURAL STEEL
Cost Estimator

Must be familiar with shop costs of bridges and other heavy construction. Permanent position. Plant located in Western Pennsylvania. State qualifications in letter to

P-3140, Engineering News-Record
520 N. Michigan Ave., Chicago 11, Ill.

POSITIONS VACANT

CONSTRUCTION SUPERINTENDENT — General Contracting firm in eastern West Virginia desires man with up-to-date experience in handling medium and large size building projects. The man we want must be cost conscious and have references to demonstrate that he has recently run jobs either in commercial or public building. Reply giving age, resume of experience and salary required. P-3155, Engineering News-Record.

MANAGER TO assume complete control of small excavating and sewer contracting company located in Ohio. Give age, references, experience and salary desired. P-3148, Engineering News-Record.

STRUCTURAL ENGINEER—graduate, 5 years experience in bridge and heavy, building design. Location—eastern Pennsylvania. Send record resume and salary expected to P-3132, Engineering News-Record.

SELLING OPPORTUNITY OFFERED

SALES ENGINEER — Rochester, New York and Pittsburgh, Pennsylvania territories open with established national concern selling prefabricated metal products to engineering and construction markets. Positions are permanent and offer excellent future with aggressive, progressive and expanding organization. Engineering degree desirable. Previous sales experience unnecessary. Ages 24 to 30. Car furnished. Complete training program. Salary and bonus. RW-2289, Engineering News-Record.

ANNOUNCING
CIVIL SERVICE EXAMINATION
for
Superintendent City Water Works
CEDAR RAPIDS, IOWA

Qualifications: Age 35 to 50 years. Engineering degree and ten years experience or B S degree and 12 years experience.

Starting salary: $7,500.00.

Write Civil Service Commission, City Hall, Cedar Rapids, Iowa, for applications and information. Application deadline August 25, 1954.

EMPLOYMENT SERVICE

OVERSEAS PROJECTS Guide to most active constructors-engineers, oil co's., gov't & UN groups hiring for foreign projects. Send $1. Cove-McKane Int., GPO Box 126E, NY 1, NY.

POSITIONS WANTED

PROJECT MANAGER or Contractor's executive available. Broad experience heavy construction and buildings. Thorough organizer. Sound knowledge of field supervision, estimating, cost control, purchasing, subcontracts. New York preferred. PW-2942, Engineering News-Record.

STRUCTURAL ENGINEER — experienced in design of steel & conc. bldgs. including design of large lift slabs; structural steel checking & detailing. Location S.E. USA. PW-3043, Engineering News-Record.

ESTIMATOR—16 years experience industrial and institutional building construction. Accurate quantity take off, coupled with field experience, sound labor pricing. Preliminary design, working drawings, specifications, client negotiation. Not afraid of board work. Unassuming, professional personality. Age 39, excellent references. PW-3111, Engineering News-Record.

CHIEF ENGINEER. Successfully completing major dam project. Seek incentive opportunity. Graduate, Registered Civil and Structural Engineer all Pacific States. Soils and Foundations expert. Twenty years experience design of major dam, hydro projects, bridges, varied industrial buildings, and facilities. Personable. Aggressive. PW-3123, Engineering News-Record.

CONSTRUCTION SUPERINTENDENT. New York area. Carpenter Foreman for 25 years in all its branches. 4 years Superintendent. Available July. PW-2647, Engineering News-Record.

SUPERINTENDENT EXTENSIVE experience on Rock. Open cut, shafts, tunnel, quarry, subway. Box PW-3120, Engineering News-Record.

SALES-ENGINEER: BSCE, 32, 7 yrs with national steel fabricating firm in sale and promotion of building materials including new prestressed concrete product. Will relocate. PW-3103, Engineering News-Record.

CHIEF ESTIMATOR available to responsible General Contractor on thirty days notice. Sixteen years experience bidding, buying, building municipal, industrial and Federal projects. Excellent organizer. Record indicates satisfactory percentage obtained of dollar volume bid competitively. PW-3094, Engineering News-Record.

CIVIL ENGINEER: B.S.C.E.; 30; single; desires position overseas. 3½ yrs. design and construction experience (Domestic and Foreign) on industrial and airbase construction. Available immediately. References. PW-3074, Engineering News-Record.

CONSTRUCTION ENGINEER: — Registered Civil Engineer, 15 years experience heavy construction. Now completing projects in West Indies, previous experience Middle East, Latin America. Desires permanent connection. Some Spanish, Arabic, French. Married status. PW-3144, Engineering News-Record.

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INSPECTION METHODS ANALYST

To develop inspection methods and promote maximum thoroughness and efficiency. Graduate engineer or metallurgist with 10 years experience in design or inspection of petroleum producing and refining equipment, 5 years of which experience must be in inspection work entailing all-round knowledge of the plant equipment found in petroleum producing and refining.

Write giving full particulars regarding personal history and work experience. Please include telephone number.

Recruiting Supervisor, Box 40

ARABIAN AMERICAN OIL COMPANY
505 Park Avenue
New York 22, New York

ESTIMATOR WANTED
HEAVY CONSTRUCTION

Must be completely familiar with analyzation and pricing of all types heavy construction. Location — Southern Indiana. We are a good company and can offer an attractive arrangement to a qualified person.

P-3092, Engineering News-Record
520 N. Michigan Ave., Chicago 11, Ill.

ENGINEER-EXECUTIVE
for position of Technical Supervisor of Materials testing laboratory.

Must have at least 15 years engineering experience in soils, concrete and asphalt paving. Education and experience should be comparable to that required for Chief or Assistant Chief Engineer of Tests of one of the larger State Highway Departments. Furnish complete information and photo, if available. Replies confidential.

P-3085, Engineering News-Record
520 N. Michigan Ave., Chicago 11, Ill.

WANTED

ENGINEER with guts and vision to take charge of, design and actually build, prestressed concrete beams and slabs. Salary in line with proven ability. Complete resume first letter.

P-3107, Engineering News Record
520 N. Michigan Ave., Chicago 11, Ill.

WANTED

Designing engineers, highways-thruways, bridges, airfields, drainage, sanitation, hydraulic, soil mechanics, structural.

Draftsmen, designers, to Project Manager.

Submit resume

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101 Park Ave. New York 17, N. Y.

POSITIONS WANTED

CIVIL—STRUCTURAL Engineer; thirty years diversified experience; planning, designs, specifications, supervision, office, field, steel, reinforced concrete, timber structures; power plants, oil refineries, airbases, site development, port facilities, hospitals, theatres, commercial sky scrapers. Includes six years overseas Europe, South America, Pacific. Foreign assignment preferred; available June 30. PW-3135, Engineering News-Record.

PROJECT MANAGER, 28, now employed, desires permanent responsible position. Six years experience in purchasing, expediting, drafting, field supervision, estimating, and cost accounting with General Contractor. PW-3126, Engineering News-Record.

PROFICIENT AND experienced to supervise and direct heavy engineering construction work and to make detailed cost estimates. Great Lakes area. Age 46, graduate, single. PW-3133, Engineering News-Record.

CONSTRUCTION OR mining foreign managerial position sought. Graduate professional engineer 17 years supervisory field experience hydro electric and mining construction. 10 years foreign. 41 years age. Reply, PW-3145, Engineering News-Record.

ENGINEER, REG. P.E., Age 31 experience in mechanical and civil engineering., desires position with municipality or county in N. Y., Penna., Ohio. PW-3171, Engineering News-Record.

GRADUATE CIVIL Engineer with law degree —age 32—5½ years experience in construction—Seeks position utilizing engineering-legal training. PW-3167, Engineering News-Record.

ENGINEER WITH business administration course desires position with architects, contractors or financial firms. 20 years experience in construction, cost and estimates. Just returned after 3 years in Africa and Europe as cost engineer on large projects. Knowledge of several languages, single and free to travel. PW-3163, Engineering News-Record.

RESIDENT ENGINEER or Superintendent of Construction on water or sewerage disposal plants and systems. Fifteen years experience in utility construction, maintenance, and operation. Age 43 and married. Seeks new location. PW-3161, Engineering News-Record.

PART TIME WORK WANTED

PART TIME Work—Retired licensed structural engineer available for structural design, shop detailing, estimating. PTWW-3025, Engineering News-Record.

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Must be experienced in excavation, concrete, masonry, and carpentry take-off, for all types of public, commercial and industrial buildings. Reply giving age, education, experience, salary desired. Milwaukee, Wisconsin.

P-2860, Engineering News-Record
520 N. Michigan Ave., Chicago 11, Ill.

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Excellent opportunity for men with experience on bridges and expressways. Give complete resume and salary required in first letter.

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Northwest 80-D Shovel-Crane. Diesel.
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P&H 955-ALC. Diesel Crane, 130' boom, 1951.
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Buc. Erie 54-B Shovel-Dragline. Excellent.
Buc. Erie 120-B Electric Shovel. 5 yds.
Lorain L820 Shovel-Crane-Drag. 2 yds.
Manitowoc Mod 3500 Diesel Shovel.
Manitowoc 4500 Shovel-Dragline. New 1951.
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American Mod. 10125, 50 tons, 40' radius 125' boom.
Colby Mod. 200, 45 tons, 30' bm., 10' whip.

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Buckeye Model 160. Excellent.
Parsons Model 310.
Cleveland Model 320. Diesel powered.

CONCRETE PLANTS—BINS & SILOS
B-K 100 ton, 3 comp., 2 Cement Silos 450 bbls. ea.
Noble CA-155 Fully auto., 5 comp. New 1951.
Noble CA-154 auto., 4 comp., 2 yd. Smith Tilt Mixer.
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Heltzel 4 Comp., 3 agg., 150 yds., 200 bbls. cement.
Johnson 200 yds., 4 agg. bins, 200 bbls. Cement Cau.
Cement bin 400 bbls. with batcher. NEW.
Agg. bin, 100 tons 3 cpts. 2 yd. weighbatcher. NEW.
2 Smith 56-S tilting 2 yd. elec.
Seaman Bituminous Mixer Model MHD 72-33.

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Barber-Greene 848 complete plant.
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Amer. 30 ton Guy derrick 116' mast 106' boom.
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Steel Stiff leg Derrick 50 Ton, 100' Boom.
Steel stiff leg derrick, 30 tons, 100 ft. boom.
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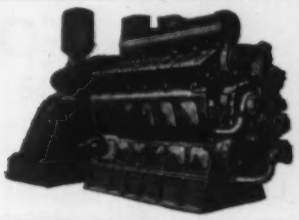

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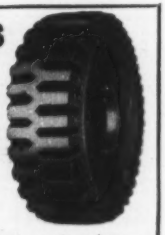

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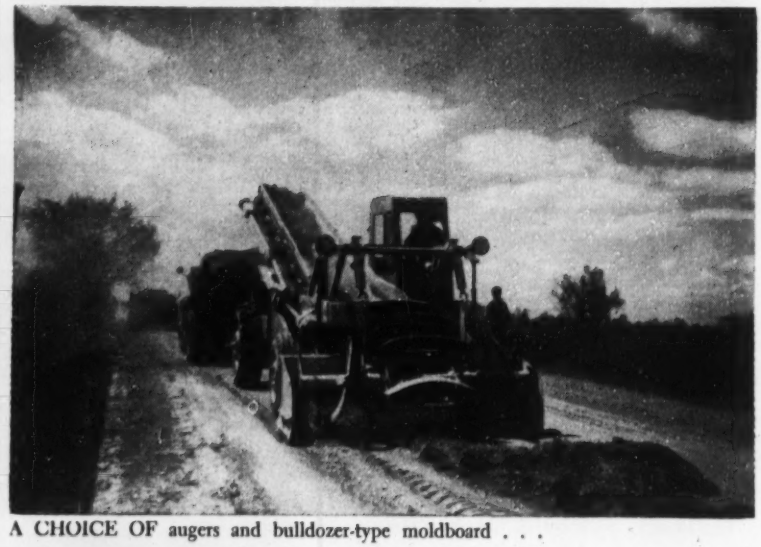

A CHOICE OF augers and bulldozer-type moldboard . . .

OR ANGLED grader-type moldboards is offered on . . .

Athey's new Model 7-11 loader

An improved windrow and stockpile loader at lower price has been introduced by Athey Products to supersede the Model 3. The new rig is designated the Model 7-11 Force-Feed Loader and has been developed to give the user a machine matched to his job in one basic model.

This new unit can be fitted with two moldboard-feeder arrangements to meet a variety of job conditions. One setup includes augers and a bulldozer-type moldboard that can load from either stockpile or windrow with a 90-in. width of gather.

The other feeder arrangement includes two tapered, grader-type moldboards angling out from the front to provide an 84-in. width of gather—12 in. wider than the Model 3—for windrow work where oversized material such as pieces of sod, ripped blacktop, concrete or rocks is encountered.

The new loader also features a heavy duty industrial engine, the 101-hp 6-cyl Ford 215 with a bigger, pressure-sealed cooling system. A new two-speed vacuum-shift rear axle is now standard equipment and is of the wheel-reduction type.

Loading speeds on the new model

(Continued on page 86)

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Prevents corrosion!

use this Corporation Stop with Insulating Coupling Outlet!

Designed for a specific need, this Corporation Stop with Insulating Coupling Outlet minimizes electrolytic action and subsequent corrosion by completely insulating copper service lines from the main.

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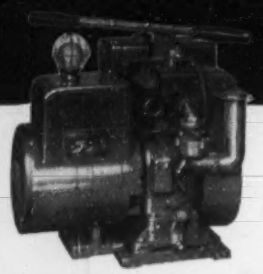

When uninterrupted construction of off high line jobs means the difference between bonus and penalty for speed of construction, you'll need Fairbanks-Morse dependable power generating sets.

Fairbanks-Morse generators are available in capacities from 600-watt portables for surveying and pioneering crews, to 75-kw. sets that supply power for all lights and construction tools. For a completely descriptive catalog, write Fairbanks, Morse & Co., Chicago 5, Ill.

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NEW PRODUCTS

range from 0.26 to 1.74 mph and travel speeds to 20 mph. Optional equipment includes: an operator's cab of steel with safety glass windows, heater and defroster; a side discharge conveyor to speed windrow loading where a second lane is available; a cleated belt for snow removal; a 3-ft extension to the 25-ft conveyor to increase the loading height to 12 ft 3 in.; four-wheel brakes and an hour meter for the engine.

The 7-11 has been field tested for o er a year on a number of operations, including a quarry operation where it was called upon to handle all kinds of classified stone and gravel. Biggest job during this time was the loading of ¾ to 2-in. crushed limestone mixed with bank-run gravel that was used for sub-base at an air base. Here it is said to have loaded as much as 1,800 tons of material in an 8-hr shift. Athey Products Corp., 5631 W. 65th St., Chicago, Ill.

Plastic valves feature low maintenance costs

A new line of molded, globe-type polyvinyl chloride valves has been developed for application throughout the chemical process, petroleum, rayon, plating and allied industries where non-corrosive material is required. The valves are designed to operate at medium pressures and temperatures not exceeding 160 F.

The valves are said to incorporate many efficiency and economy features such as the ability to repack the stem with Teflon packing even under full line pressure. It is reported that no packing of any type is needed at the valve seat, however, and that the disk is easily replaceable.

Valves are made to fit pipe sizes of ½, 1 and 1½ in. while maintaining full flow characteristics. The 1-in. valve has been tested at 1,500 psi and is designed to operate at a working pressure of 150 psi. Stokes Molded Products, Taylor St. at Webster, Trenton 4, N. J.

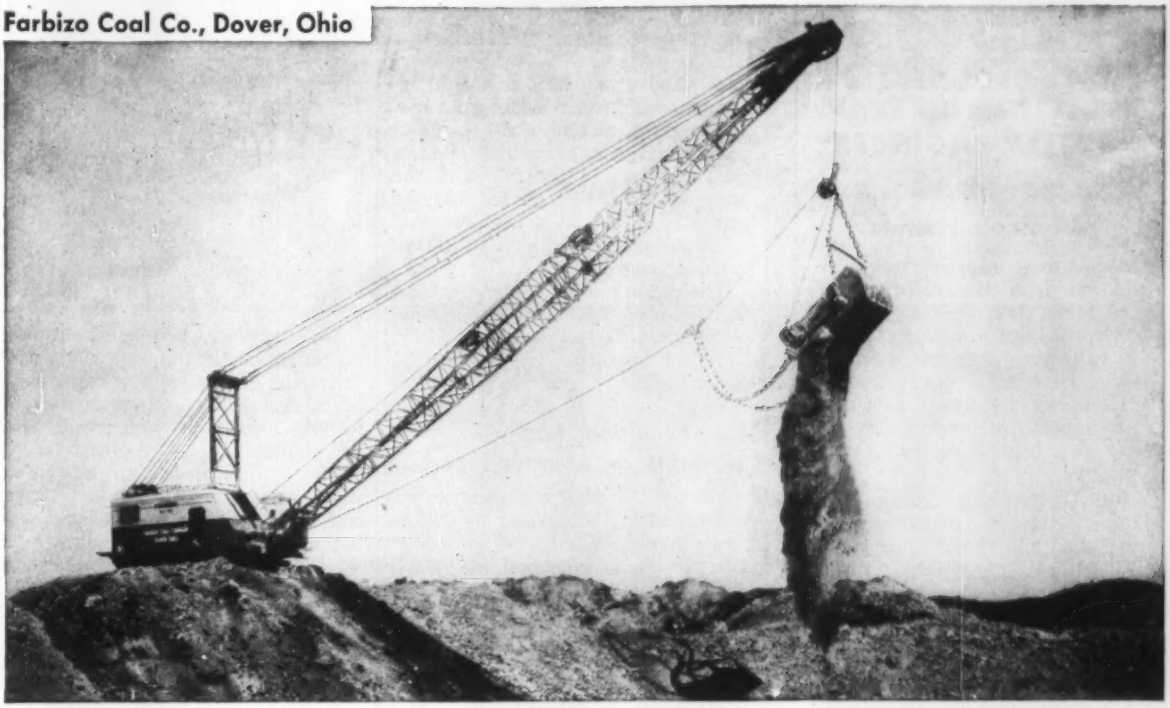
Grout-filled tube forms clay pipe pressure joint

A new technique, developed for making pressure-tight joints in vitrified clay pipe, employs a hollow rubber gasket similar to an inner tube.

The gasket is placed over the spigot end of the clay pipe and inserted into the bell end of the adjoining length. A grout mixture is pumped into the tube under 50 lb pressure through a small valve. The gasket expands uni-

(Continued on page 88)

Farbizo Coal Co., Dover, Ohio



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ONE OF FARBIZO'S GRADALLS has done an outstanding job on a 38 core slag pit. Cities Service DC-300 oil keeps Farbizo's hard-working Gradall shovel in top shape.

IN THEIR TD 24 BULLDOZER TOO, Farbizo relies on heavy duty, high detergent Cities Service DC-300 oil. Heat-resistant, long-lasting and free-flowing DC-300 does the finest job possible.

Twin G.M.C. Diesels in Marion Shovel Give Outstanding Performance!

Here's the story from the Farbizo Coal Co.:

"Following are the pertinent facts with reference to the Marion 111 M Shovel using DC-330 Oil since January, 1951:

"Developed ample power with TWIN G.M.C. Diesels operating at 1550 R.P.M. Operated 16,280 hours with no motor breakage or repairs. Mined 203,000 tons of #5 coal from 36" seam with an average over burden of 35 feet hard pan shale with streaks of iron ore bands.

"Oil consumption 1 pint per week, oil and filters changed weekly. Consumption is same as when shovel was new. Motors were recently inspected but no repairs or replacements needed. Unusual performance praised by G.M.C. and Marion Shovel representatives.

"Similar results using DC-300 Oil in two Gradall shovels and International TD 24 Bulldozer."

Let Cities Service lubricants protect the important investment you have in your machinery. Call your nearest Cities Service representative or write Cities Service Oil Co., Sixty Wall Tower, New York 5, New York.

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QUALITY PETROLEUM PRODUCTS

COMMENT
from the
BUTLER ENGINEER

. . . of Taconite and Women's Names

Made a most inspiring trek into the vast iron country of northern Minnesota. Five companies are spending *800 million dollars* in an enormous development to mine taconite. Always thought taconite was a low grade, unprofitable iron ore. 'Tain't so. It's just difficult to get at and get out.

Anyway, they're building a new town to house 10,000 people and expanding another to house 5,000 more. Those projects will involve many hundred thousand yards of concrete . . . Now you've guessed the "why" of my visit. *Whenever there's concrete in your future you'll see the Butler Engineer looking at you in your crystal ball.*

This enormous development (and 800 million dollars is only the beginning) will change the economy of our country — and for the better. There'll be enough iron for a thousand years.

Noticed many of the towns in that sparsely populated area bear women's first names, such as Virginia, Effie, Ruby. Asked why. Won't repeat the answer here as directly as it was given me, but it seems that in the early days those bearded, lusty and hard-working gentry of the mines and timber liked moments of relaxation away from pickax or saw. Certain gay members of the feminine gender who ventured into that wilderness to provide relaxing roofs were honored by this geographical immortality.

Am I obscure? Take the "t" out of immortality.

Great Day! The orders that have come in for Ready Mixed and Roadbuilders Plants!

Recession? How do you spell a Bronx cheer?

The Butler Engineer

BUTLER BIN COMPANY
947 BLACKSTONE AVENUE
WAUKESHA, WISCONSIN

formly and is said to form a tight infiltration-proof seal after the grout sets.

The grout mixture used consists of portland cement, water and TJ-41, a special compound available with the pressure joint. It is injected into the gasket by means of a hand-operated grout pump equipped with a dial-type pressure gauge.

The pressure joint is available for 8 to 36-in. pipe from member companies of the CLAY SEWER PIPE ASSN., INC., 311 HIGH-LONG BLDG., 5 E. LONG ST., COLUMBUS 15, OHIO.

Electric dipper trip available on Bantam shovels

Electrically-operated dipper-trips are now available as optional equipment on Bantam truck and crawler-mounted ¾-yd shovels. It is reported that operating speed and efficiency are increased since the operator may swing and dump without changing controls.

A thumb-operated push button switch is mounted on the swing clutch lever. This actuates an electric motor mounted on the boom to wind up a chain and trip the bucket dipper. Power is supplied from the basic unit battery through a solenoid arrangement connected to the dipper wind motor.

Optional on all new Bantam shovels, the new shovel trip attachment can be installed on all previous models. SCHIELD BANTAM CO., WAVERLY, IOWA.

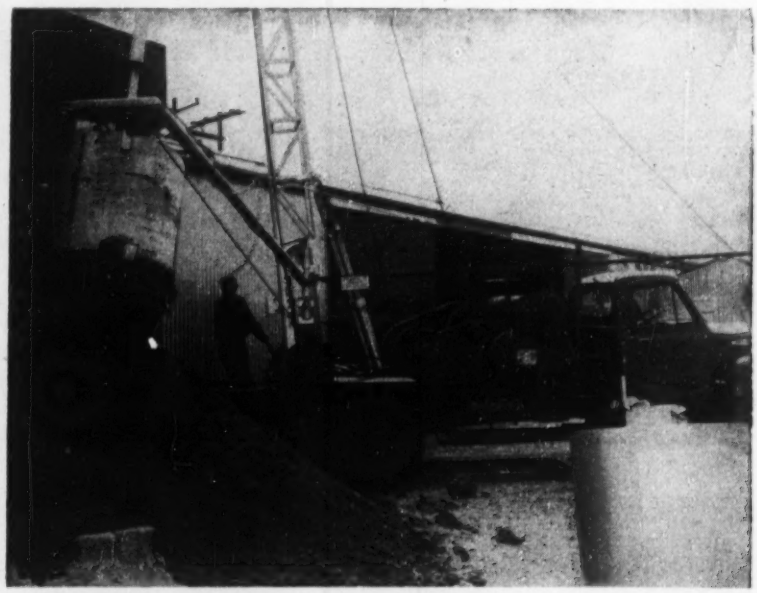
Power company "deadends" used in prestressing work

Originally designed for pole line messenger, static and guy wire work, Strandvise fittings are now being used by fabricators of prestressed concrete to hold 260,000 psi high tensile wire and strand.

The fittings as first manufactured were equipped with a gripping sleeve and a bail attached to a collar. Users in power companies commonly termed them "deadends." For prestressing applications the unit has been redesigned with the bail removed.

The shank or sleeve end of the Strandvise contains three zinc-coated jaws. According to the manufacturer, the gripping jaws do not damage the zinc coating of the strand, but actually improve the ability of the strand to resist corrosion even in the

(*Continued on page 90*)



Bucket-type earth drill improved

To eliminate the hazardous operation of manually swinging earth boring buckets to a dumping position away from the hole, a mechanical system has been devised. The new device is operated from a control panel and powered by the winch hoist. The arm will be supplied as standard equipment on all models of Calweld earth boring machines for drilling holes 100 to 200 ft deep and 16 to 84 in. in dia. The new positioning arm also has been made available for installation on older models of Calweld earth drills. California Welding and Blacksmith Shop, Inc., 7222 E. Slanson Ave., Los Angeles 22, Calif.

Raymond Features!

NUMBER SIX OF A SERIES

Raymond service

SAVES YOU MONEY!

FOR the Anheuser-Busch Brewery, Newark, New Jersey, the Raymond Concrete Pile Company performed the soil investigation, drove the test piles, and installed the bearing piles. The work was completed ahead of schedule—a typical example of Raymond's three-point service in action. We welcome the opportunity of discussing your foundation problems.

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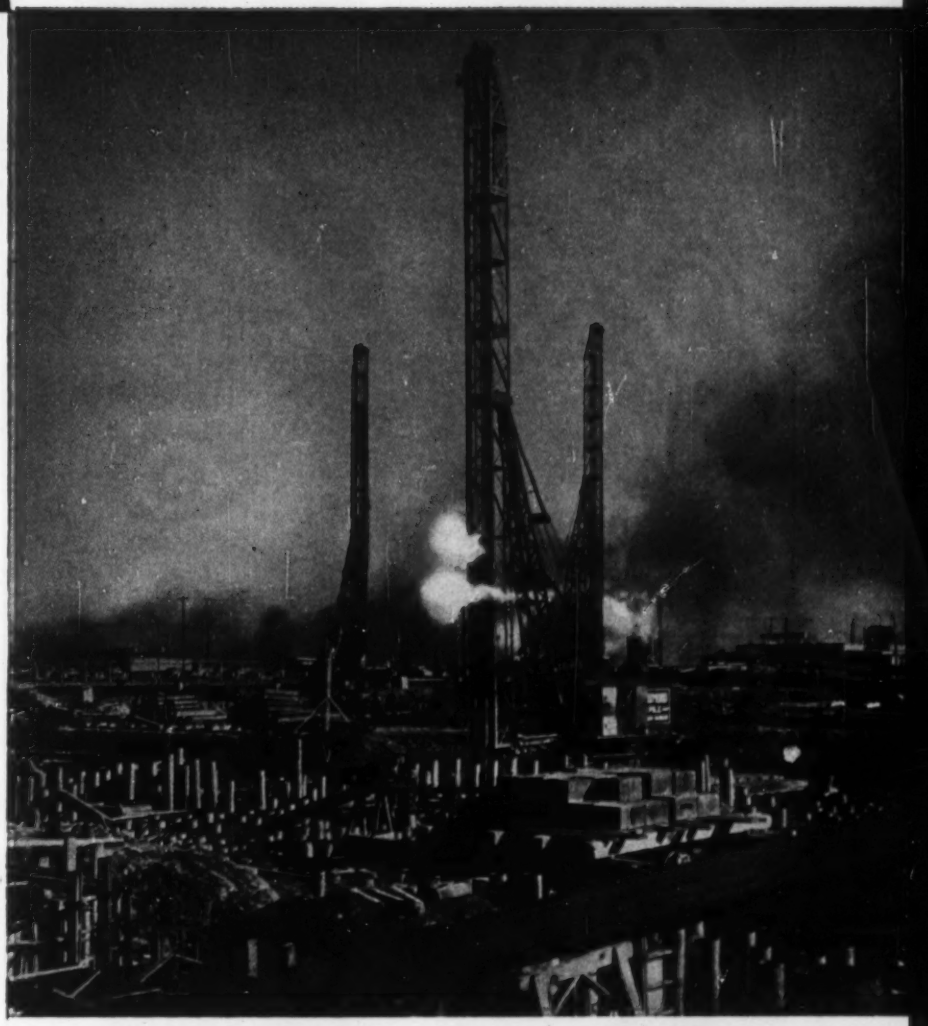
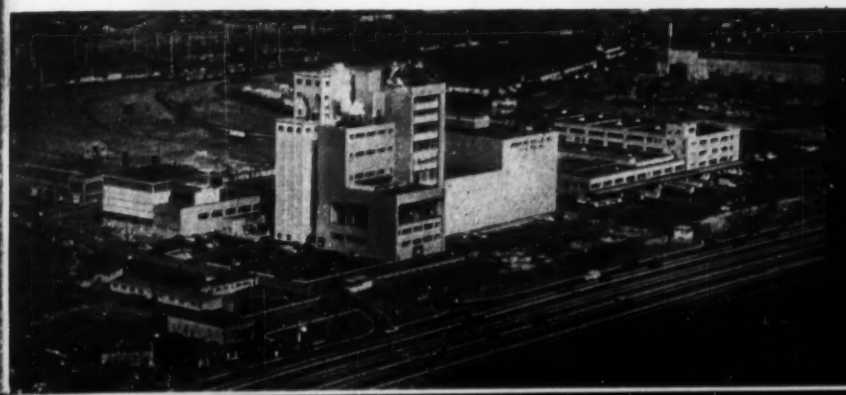


Raymond rigs driving piles at the Anheuser-Busch Brewery in Newark, N. J.

ENGINEERS: Harley Ellington & Day, Detroit
GENERAL CONTRACTOR: Geo. A. Fuller Co., New York



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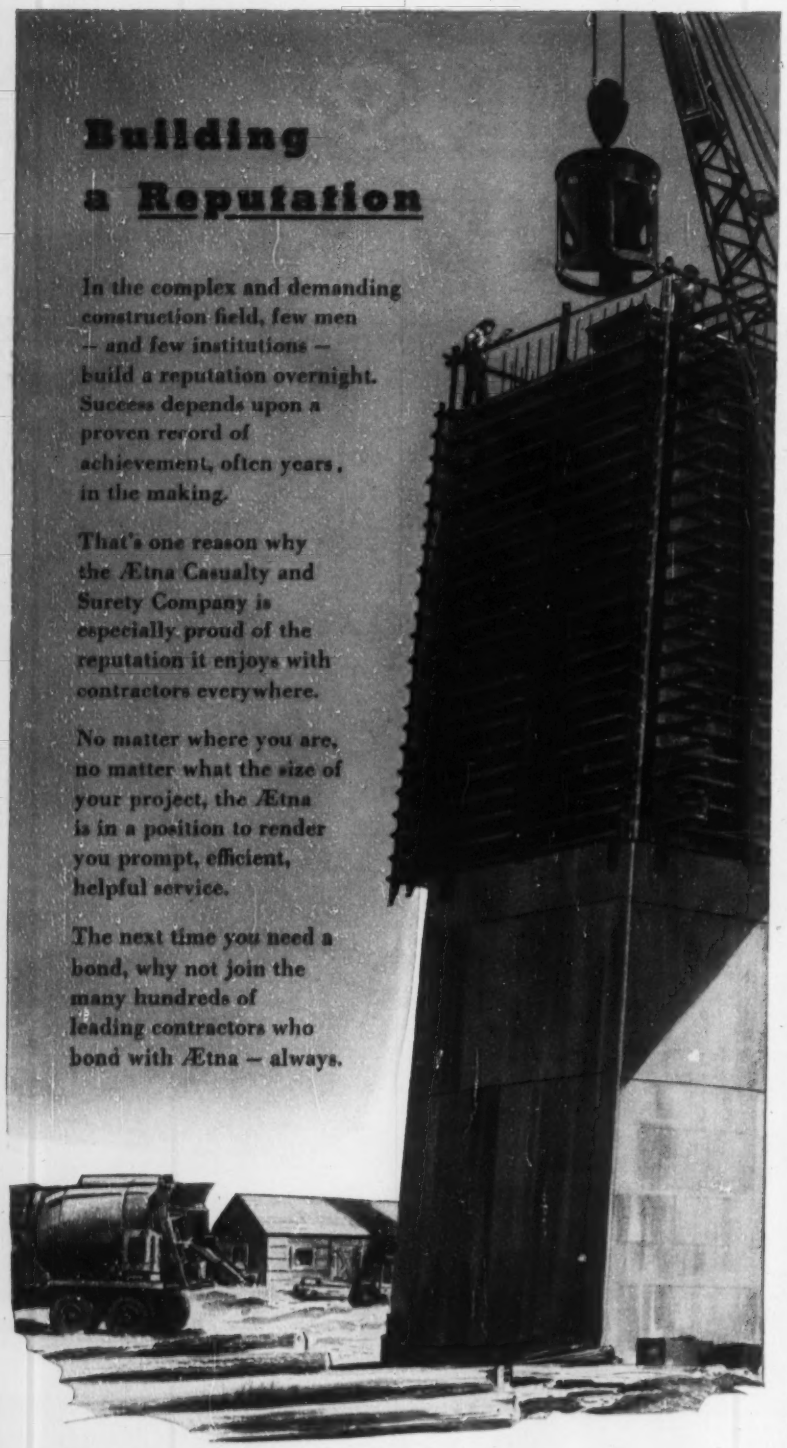
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gripping areas. In addition the jaws are coated with a chemically reinforced oil to retard corrosion. Reliable Electric Co., 3145 Carroll Ave., Chicago 1, Ill.

Moisture control system for concrete batching

A moisture control system for concrete producing plants measures and records the moisture in concrete aggregates for every batch of concrete.

A meter-recorder is connected by lead wires to an electrode arrangement in the weigh hopper. As soon as the aggregates are dropped in the hopper, the percentage of moisture is shown and recorded on the instrument dial at the operator's station.

When this percentage together with the batch weight is set up on the Compensator, a simple cylinder-type computer, the amount of water present in the batch can easily be read—both weight and volume are given.

The system has been field tested since 1952, and considerable savings on each installation have been reported. The equipment is said to eliminate wet loads that might be rejected and also obviates wetting down of aggregates to produce proper consistency. Instant Moisture Control, Div. of Colorado Pre-Mix Concrete Co., 1021 W. Mississippi Ave., Denver 19, Colo.

Super conveyor belt permits long, heavy duty hauling

A new super strength conveyor belt has been designed for hauling thousands of tons of material per hour on one continuous belt a distance of 3 mi. According to the manufacturer, the belt marks a significant advance for coal, iron and copper mining and for dam construction both from the standpoint of cost reduction and more efficient operation.

The belt uses a new type of cellulosic yarn that is treated chemically to give it high strength. It is reported to be three times stronger than rayon belt fiber fabric and three and one-half times stronger than the cotton duck used in belts today.

The new yarn is used as the longitudinal part of the belt fabric; DuPont nylon, because of its shock absorbing ability and greater flexibility, is used as the crosswise fiber.

In dam construction, the new belt makes possible over 3-mi center distances in systems carrying aggregates from supply points to the dam site. The longest belt system used in dam

(Continued on page 92)

BRIXMENT

Better Mortar for Blocks

BETTER BODY

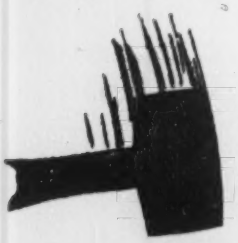
When concrete block are laid, the mortar should have "body", to support the weight of the unit, thus holding it up to the line. If the mortar lacks body, the block will settle below the line even if a thick bed of mortar has been spread.

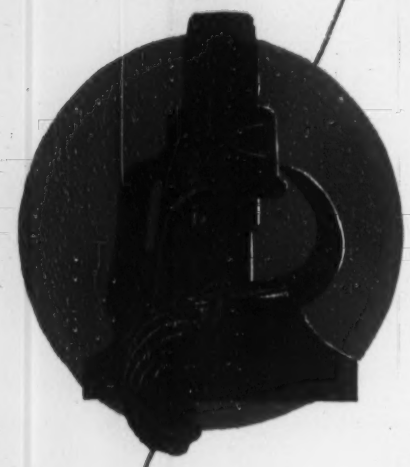
At the same time, plasticity is required. Unless the mortar is plastic, the bricklayer cannot quickly and accurately tap the block down to the line.

Brixment has body and plasticity. It is firm but not stiff — soft but not sloppy. This combination of body and plasticity makes Brixment the best possible mortar to use with concrete blocks.

Morse-Starrett
WIRE ROPE CUTTER

CUTS WIRE ROPE





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Models for tool kit or stationary operation. With cutting capacities up to: 1 inch, 1-1/16 inch, 1½ inch.

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construction to date is the installation at Shasta Dam in California in 1940. The system used 26 flights for the 9.6 mi haul, whereas with the new belt the number of flights could have been reduced to three.

The longer center distance eliminates transfer points and thereby reduces the number of necessary drives and the manpower required to control and maintain the system. United States Rubber Co., Rockefeller Cent., New York 20, N. Y.

Triple-purpose unit pumps, generates, charges batteries

The Handi-Plant is a new power unit that combines the functions of a portable pump, a battery charging set and electric generator.

Powered by a 1-cyl, 1.7-hp, 4-cycle gasoline engine, the outfit delivers 600 watts of 110-v, single-phase, 60-cycle alternating current. The two-bladed impeller-type pump unit has a capacity of 1,500 gph and a 15-ft lift.

The plant is capable of pumping water and generating electricity simultaneously, and in this dual service pumps at the rate of 1,500 gph and delivers 300 watts of electricity. The Model 64ES Handi-Plant also furnishes 80 to 100 watts of direct current for charging 6-volt batteries.

Total weight of the new unit is 84 lb, and it measures a little more than 18 in. in length and is 13¾ in. high. Fuel tank, oil-bath air cleaner, pneumatic governor, muffler and adjustable belt drive for the pump are included in the self-contained unit. Price is reported little more than that of a single-purpose generator set. Universal Motor Co., 524 Universal Dr., Oshkosh, Wis.

Redesign ups power ratings for GM 6-110 diesel units

Changes in design are said to have increased the output of GM 6-110 diesel engines to 300 hp maximum and 230 hp continuous.

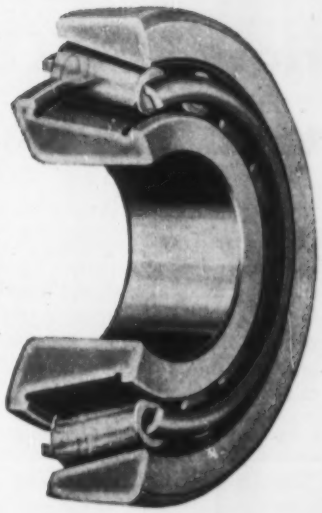
The increases, totaling 25 and 17 hp, respectively, are partly the result of increasing the number of ports in the cylinder liners. Also the ports have been grouped together in partially overlapping pairs to form larger, figure eight-shaped openings.

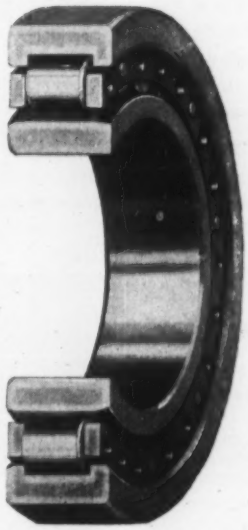
With the increased scavenging capacity thus provided, maximum engine speed has been increased from 1,800 to 2,000 rpm. Continuous operating speed is now 1,800 instead of 1,600 rpm. According to the manufacturer, the increased speeds were set

(Continued on page 95)

WHATEVER YOUR ROLLER BEARING APPLICATION

specify BOWER!





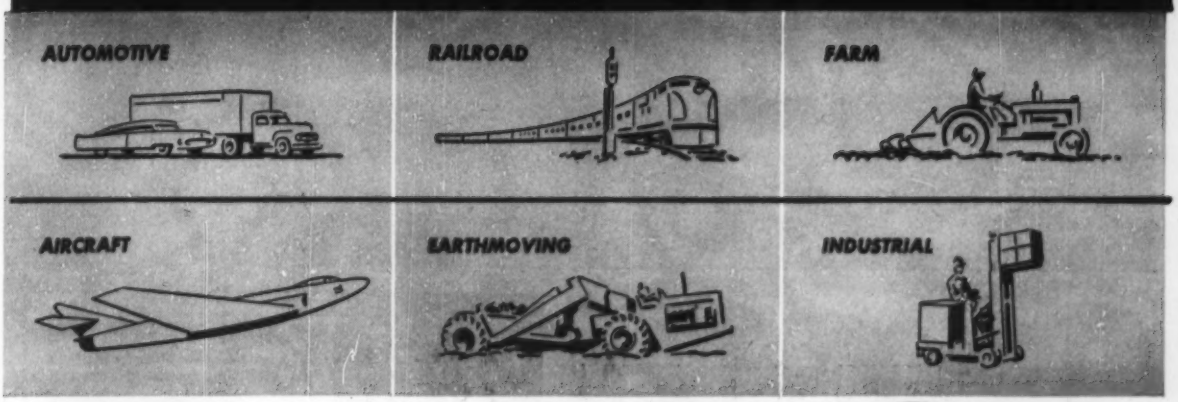
Earthmovers, jet turbine engines, rolling mill equipment, truck axles—you name it! Bower builds a complete line of tapered, straight and journal roller bearings including a size and type to fit *your* product. What's more, these dependable bearings have *proved* themselves in virtually every conceivable type of application. Their built-in quality, skillful engineering and advanced design features provide such important bearing advantages as reduced wear, longer life and lower maintenance requirements. Let a Bower engineer give you full details on the complete Bower line.

BOWER ROLLER BEARING COMPANY
DETROIT 14, MICHIGAN

BOWER TAPERED ROLLER BEARINGS INCORPORATE ADVANCED SPHER-O-HONED DESIGN! Spherically generated roll heads and higher flange with larger, two-zone contact area reduce wear, improve roller alignment and virtually eliminate "end play." This helps hold adjustment and pre-load longer and better. Larger oil groove provides positive lubrication.

BOWER STRAIGHT ROLLER BEARINGS ARE BUILT TO CARRY MAXIMUM LOADS! Integral two-lip race increases rigidity—keeps rollers in proper alignment at all times. Steel cage allows free movement of rollers between races during normal operation. High-grade alloy-steel rollers and races are precision-ground for quieter, smoother operation.

A COMPLETE LINE OF TAPERED, STRAIGHT AND JOURNAL ROLLER BEARINGS
for every field of transportation and industry



BOWER
ROLLER BEARINGS

SPHER-O-HONED

How TIMKEN® bearings help reduce cable wear in Bucyrus-Erie walking dragline

WHEN this big 1250-B Bucyrus-Erie dragline drags, hoists, swings, and dumps, there's plenty of stress on the boom point sheaves. To keep them operating trouble-free and prevent excessive cable wear, they're mounted on Timken® tapered roller bearings.

Each of the two sheaves in the swivel yoke is mounted on a pair of Timken bearings. Because of their tapered construction, Timken bearings take radial and thrust loads in any combination.

There's less wear caused by the cable slipping on the sheaves, too. The true rolling motion and incredibly smooth surface finish of Timken bearings practically eliminate friction.

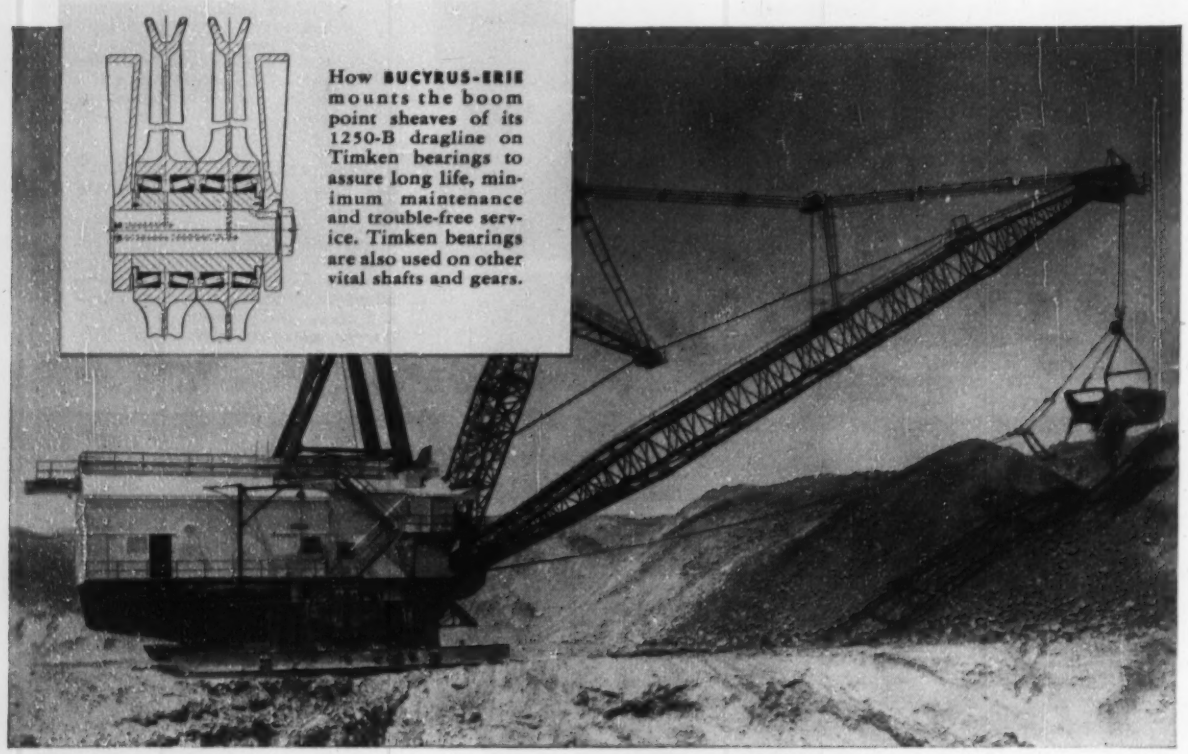
There's no danger of the sheaves not standing up to occasional overloads because wide line contact between rollers and races gives Timken bearings load-carrying capacity to spare.

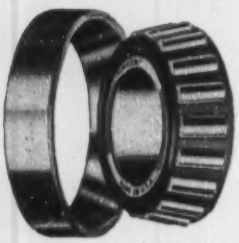
Even sudden jerks caused by cable slack during the drag operation don't affect Timken bearings in the boom point sheaves. Rollers and races of Timken bearings are case-hardened to give them hard, wear-resistant surfaces over tough, shock-resistant cores.

To get dependability like this in the equipment you build or buy, always look for the trade-mark "Timken" stamped on every bearing. The Timken Roller Bearing Company, Canton 6, Ohio. Canadian Plant: St. Thomas, Ontario. Cable address: "TIMROSCO".

This symbol on a product means its bearings are the best.

How **BUCYRUS-ERIE** mounts the boom point sheaves of its 1250-B dragline on Timken bearings to assure long life, minimum maintenance and trouble-free service. Timken bearings are also used on other vital shafts and gears.





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TRADE-MARK REG. U. S. PAT. OFF.

TAPERED ROLLER BEARINGS

WE MAKE OUR OWN STEEL

The special grade alloy steel which gives Timken bearings their strength and resistance to wear is made in our own steel mills.

The Timken Roller Bearing Company is the acknowledged leader in: 1. advanced design; 2. precision manufacturing; 3. rigid quality control; 4. special analysis steels.

NOT JUST A BALL ○ NOT JUST A ROLLER ▭ THE TIMKEN TAPERED ROLLER ▭ BEARING TAKES RADIAL ◫ AND THRUST ◫ LOADS OR ANY COMBINATION ◫

only after several thousand hours of operation proved them to be consistent with long engine life.

Other changes designed to contribute to greater operating efficiency and longer engine life include a new "high valve" injector, roller bearing idler gear mountings and larger piston struts.

An SAE #1 flywheel housing size is also offered to permit the use of additional standard transmissions without the use of an adapter ring. DETROIT DIESEL ENGINE DIV., GENERAL MORORS CORP., 13400 W. OUTER DRIVE, DETROIT 28, MICH.

Securing rig has automatic tension control of cables

A new securing rig, said to permit quick, easy anchoring of guy wires and cables, also provides automatic control of tension to assure uniform cable tightness.

Essentially the rig consists of an adjuster mechanism and a tension-controlling compression spring. The free end of a guy wire or cable is passed through a special locking mechanism attached to the tensioning spring and then pulled through until the spring is fully compressed. It is then released to open the spring slightly, and a locking lever is then snapped over into a safety lock keeper.

Called Tyzen, the standard fasteners provide a cable tension of 100 lb and are available for any size cable up to and including $\frac{7}{32}$ in. Other units are available for various tensions, load capacities and cable sizes. EASTERN ROTORCRAFT CORP., BOX 110, DOYLESTOWN, PA.

New products briefs . . .

•Power saw—A new 7-in. W70 builders' saw is being produced by Stanley Electric Tools, New Britain, Conn. Designed for builders, the W70 is reported to cut a dressed 2x4 at 45 deg and cuts from $\frac{3}{8}$ in. to $2\frac{3}{8}$ in. at 90 deg. Saw will accommodate $\frac{1}{8}$-in. abrasive wheels and comes furnished with a combination rip and crosscut blade. GA-160 ripping guide is available as an accessory. Net weight of saw is 12 lb.

• Conveyor belt cover—A new conveyor belt cover has been developed by Raybestos-Manhattan, Inc., Manhattan Rubber division, Passaic, N. J. According to the company, the belt cover promises resistance to abrasion and tearing never before attained, meaning longer belt life, especially under heavily abrasive conditions.

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EDITORIALS

Confused highway planning

THE FOLLY of having major highway planning handled by two or more independent agencies is all too apparent in the bickering now going on over connections between the New York Thruway and New Jersey's two toll highways, the New Jersey Turnpike and the Garden State Parkway. Each of the latter is operated by an agency independent of the New Jersey State Highway Commission. They in turn deal with the New York State Thruway Authority, which is nominally independent of the New York State Department of Public Works, although still quite closely tied to it.

The New York State Thruway comes down the west side of the Hudson River to the New York-New Jersey line at Suffern, which is about 12 miles west of the river. There it turns east, running roughly parallel to the state line to Nyack, where it will cross the river on a bridge now under construction. The New Jersey Turnpike terminates at U.S. 46, one of the main east-west highways leading to the George Washington Bridge at a point 12 miles south of the state line and 18 miles from the new bridge. Extension of the Turnpike northward to a connection with New York's Thruway has been authorized. The most direct link to the bridge would pass through built-up territory, and some of it is very rugged.

The northern end of the Garden State Parkway, on the other hand, lies about 10 miles west of the Turnpike in less congested territory, and its present northern terminus is nearer the New York line. It is being built by the New Jersey Highway Authority, which also has power to build to the line for a link to the New York Thruway.

What brought a long smoldering controversy into the open was announcement of an agreement between this highway authority and its counterpart in New York for construction of such a link. Advocates of a connection to the New Jersey Turnpike rather than to the Parkway were quick to point out that such a connection would serve only the drivers of private automobiles, as commercial vehicles and trucks are barred from the Parkway. Also, that such a connection would not provide a proper route for trucks operating between the Turnpike and the New York Thruway even though the Parkway act were amended to let trucks use the northern end.

In most of the current discussion there is little evidence of any broad regional thinking. Expediency, increasing the number of toll-paying vehicles, or meeting the objections of local communities that do not want another major highway cutting through their towns seem to be the controlling factors given greatest weight. Only the Regional Plan Association has urged that regional needs get first consideration.

The men who ought to have the final word are the traffic planning engineers of the highway department offices in Albany and Trenton. What do their origin-and-destination studies show as to types of vehicles and destinations? The answer to that question should be the basis for a decision as to what connection should be built and where it should be located. And the same basic approach must sooner or later govern toll road planning everywhere if uneconomic or inefficient layouts are to be avoided.

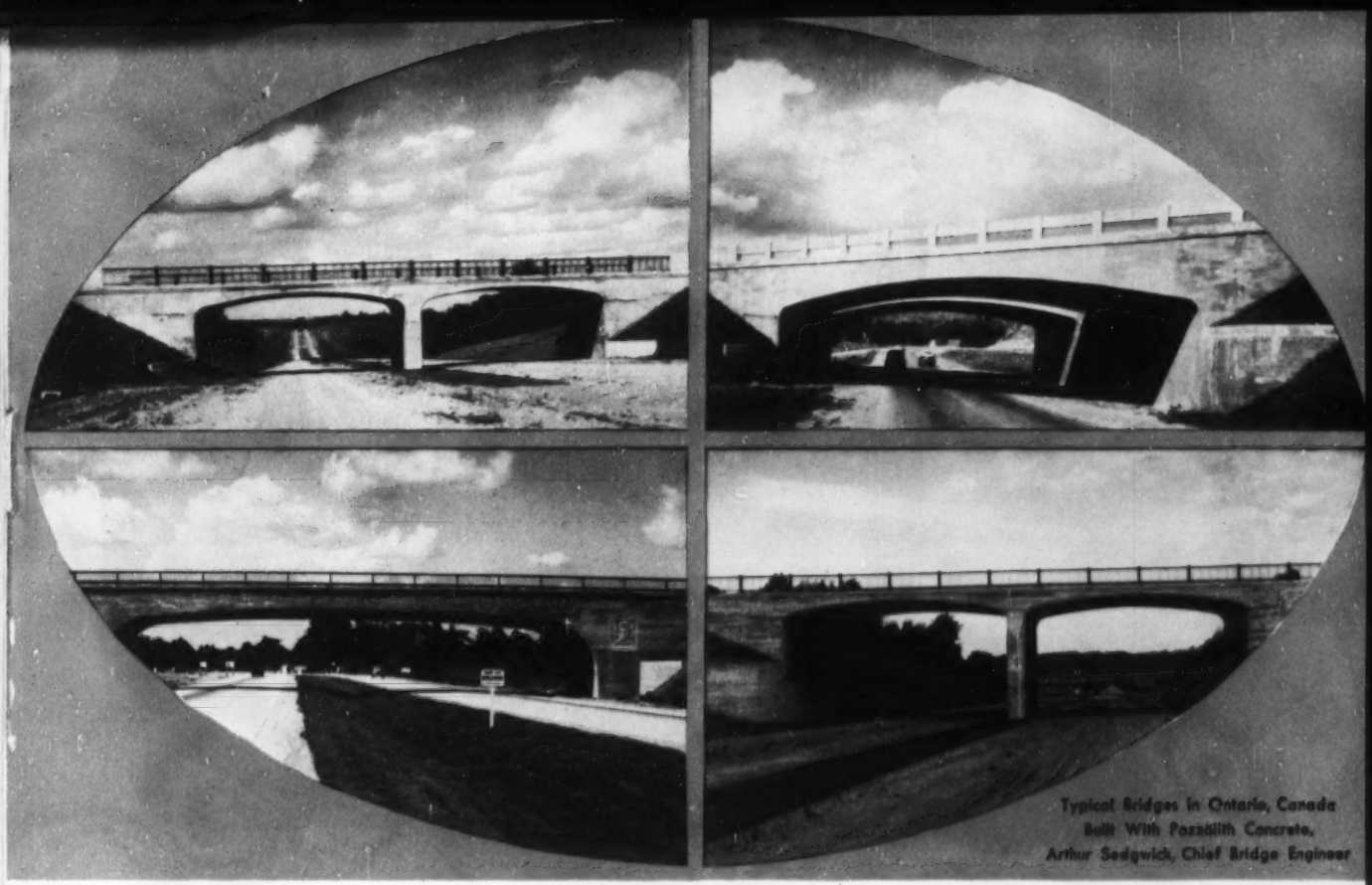
Milestone in flood control

THE WATERWAYS EXPERIMENT STATION at Vicksburg, Miss., in celebrating its 25th anniversary on June 18, could point to a record of accomplishment reflecting great credit on the Corps of Engineers and its officer and civilian personnel. Not only have the results of Vicksburg studies advanced the art and science of flood control—and of beach protection, river regulation and dam hydraulics—but they have saved the taxpayer many times his investment in the station and its maintenance.

The Vicksburg laboratory was started in 1929 as a pioneering venture for this country in the use of hydraulic models to study whole river systems or large parts of such systems. Such studies had been made in Europe, but the practice had attracted no support here, until the great 1927 flood in the Lower Mississippi forced a re-evaluation of flood control planning. As almost its first job the Vicksburg laboratory took on the major problem of determining the effect of cutoffs across the narrow necks of the larger loops in the river.

Up to that time a guiding principle had been maintenance of the river's meandering channel on the assumption that any increase in channel slope resulting from a cutoff only started serious erosion below and the formation of a new loop. But there were doubters as to this theory, and the new laboratory was called upon to determine the truth. This it did, and as a result, the Mississippi River Commission inaugurated an unprecedented program of forming artificial cutoffs that is continuing to this day, simplifying the flood control problem and reducing dredging and levee costs.

But the laboratory has tackled and solved many other problems with comparably important benefits, even to improving airfield runways as an outgrowth of soil mechanics studies originated for earthfill dams. So its usefulness is unending. There always will be floods to be controlled, channels to be kept free of costly shoaling, and hydraulic structure designs to be improved. The milestone in flood control that Vicksburg celebrated is only one in a series provided our adherence to research is constant and our willingness to invest in its results does not waver.



Typical Bridges in Ontario, Canada
Built With Pozzolith Concrete.
Arthur Sedgwick, Chief Bridge Engineer

90 Bridges In Ontario Are POZZOLITH CONCRETE

BACK in 1938 the Ontario Highways Department built two bridges of identical design — one with Pozzolith Concrete, the other with plain concrete. Their reason for employing Pozzolith was to increase workability, making practical the use of a low water-cement ratio concrete in a thin, heavily reinforced section.

Such marked improvements were obtained in the concrete produced with Pozzolith that since that time, with the exception of an interval during the war years, all highway department bridges in Ontario have been Pozzolith Concrete.

In other provinces and in many states, Pozzolith Concrete has similar acceptance for use in highway bridges.

Among the improved qualities obtained with Pozzolith Concrete are the following:

- GREATER DURABILITY — for longer life concrete
- REDUCED SHRINKAGE — for less cracking
- LOWER PERMEABILITY — for less "waterproofing" expense
- MINIMIZED SEGREGATION — for better appearance
- INCREASED BOND-TO-STEEL — for better construction
- EASIER PLACEABILITY — for lower placing costs

Full information on Pozzolith and "See-for-yourself" demonstration kit supplied on request . . . without cost or obligation.

The MASTER BUILDERS Co

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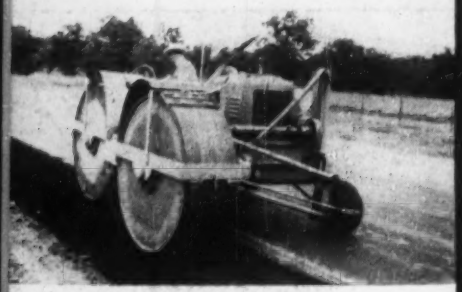
Widening existing pavement with hot-mix Texaco Asphaltic Concrete laid in four courses with total thickness of 14 inches.

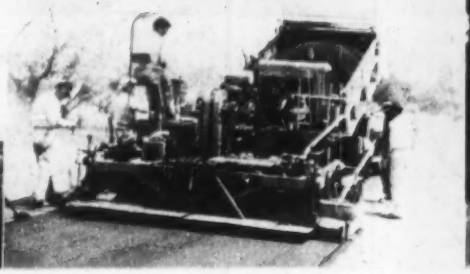


A trench roller was used to compact the four layers of asphaltic concrete laid next to old pavement.

Modernizing 29 miles of old, narrow highway

Contractor: Gulf Bitulithic Company, Houston, Texas

Blade grader spreads one of the two asphalt leveling courses constructed on 29 miles of Texas Route 6.



Putting down the Texaco Asphaltic Concrete wearing surface, bringing total thickness of new asphalt pavement to 5 inches.

View of completed project, except for shoulders. Trucks represent large percentage of highway's 3,000 vehicle a day traffic.

One of the most important recent projects of the Texas State Highway Department called for modernizing 29.7 miles of Route 6 in Brazos and Grimes Counties. The work required the use of 140,000 tons of hot-mix Texaco Asphaltic Concrete.

Two different methods were employed in widening the old 9″x6″x9″ concrete pavement. For 19 miles, a 14-inch thickness of asphaltic concrete was added at either side. The other section was widened with 8 inches of crushed stone on a 4-inch sand cushion. The entire mileage was resurfaced with a three-course asphaltic concrete pavement, having a combined thickness of five inches.

An interesting feature was the use of a 135-penetration Texaco asphalt in the asphalt mix for widening, as well as for the two leveling courses of the new pavement. A 90-penetration Texaco asphalt went into the wearing surface. These two products, like every other Texaco asphalt cement, cutback asphalt and slow-curing asphaltic oil, are produced from scientifically selected crudes. Into their refining, Texaco puts the experience acquired in supplying asphaltic materials to American road builders from the Atlantic to the Rockies for over half a century.

Helpful information on all types of asphalt construction for streets and highways is supplied in two Texaco booklets, which are yours for the asking, with no obligation.

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